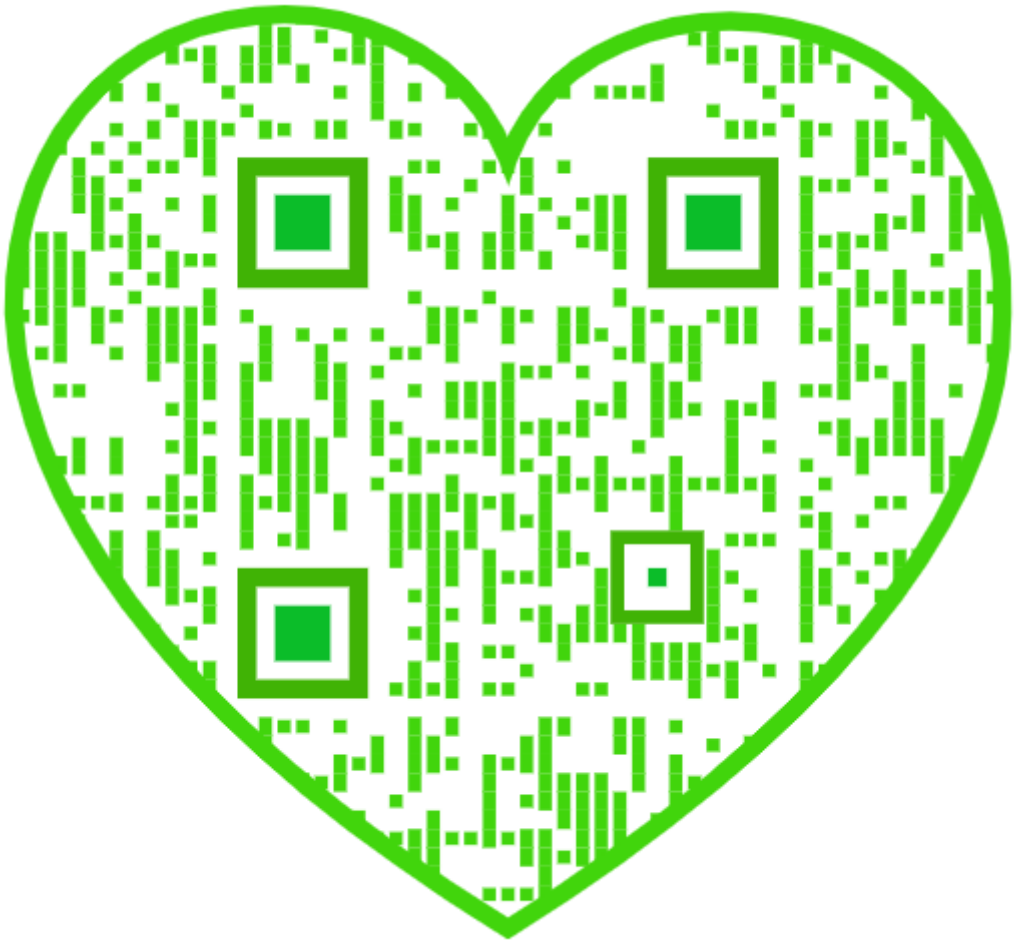

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ORIGINAL ARTICLES.

THE NERVE CELLS IN HEALTH AND DISEASE.

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(Continued.)

VALUABLE as was the method and work of Golgi, he, like many others who preceded him, formed theories which his method could not substantiate. Golgi's work was valuable for (1) his method of staining nerve cells; (2) the separation of all nerve cells into two classes; viz., those with long axis cylinders, or cells of the first class, and those with short axis cylinders, or cells of the second class; and (3) the discovery of the lateral branches on the main stem or axis cylinder. His mistakes were in supposing that the protoplasmic branches of nerve cells were concerned with nutrition only, and had nothing to do with conveying nerve currents. He also represented the collateral branches of the axis cylinder of the cells of the first class as anastomosing with each other, and with the axis cells of the second class. Further, he supposed that the cells of the first class were motor in function, while those of the second class were sensory in function. (See Fig. 22.) Ramon y Cajal cleared the ground of these erroneous ideas regarding the relation of the posterior nerve root fibers to the fiber within the substance of the cord, and proved conclusively that there is no anastomosis in any form of the fibers passing into the cord with those within the cord, but that the fibers are distributed as we have described, and come in contact only with fibers on the body of nerve cells within the cord.

From the article it can be seen that all nerve cells naturally fall into two general classes; first, those cells the bodies of which remain in the bulbo-spinal axis, and which may be termed intrinsic; second, those the cell bodies of which are outside of the bulbo-spinal axis, and these we may term extrinsic. The first class may be subdivided into two general groups; first, those with axis cylinders remaining within the neural tube and making up a large class of nerve cells; namely, the central cells, the function of which is to connect different parts of the central nervous system with each other; and second, those where the axis cylinders extend outside of the neural tube and enter into physiological relation with muscles and other tissues. These are the efferent nerve cells. The extrinsic cells are found in the posterior spinal ganglia and the corresponding ganglia of the cra-

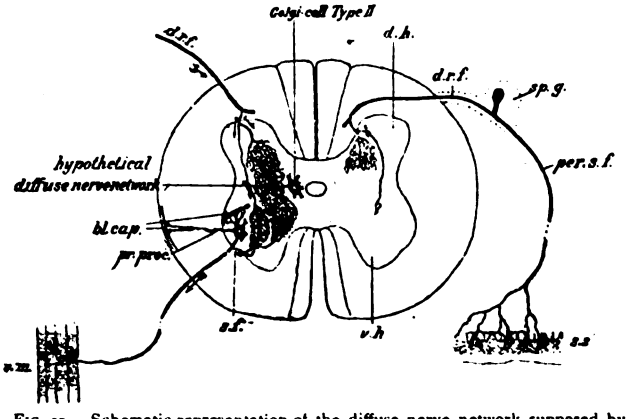

FIG. 22. Schematic representation of the diffuse nerve network supposed by some investigators to be formed by means of the side fibrils of cell Type I and the axones of cell Type II. The sensory fibers of the dorsal root are shown entering into connection with this diffuse nerve network, and the course of impulses concerned in simple reflexes according to this view is shown by the direction of the arrows. By this means the cell body and protoplasmic processes were supposed to be excluded from the reflex arc. The dendrites were supposed to be purely nutritive in function, passing out to be connected with the walls of blood vessels, whence the nutrient supply was derived, as shown in the figure. All the evidence goes to show that this view is incorrect. *v. h.*, ventral horn of gray matter; *d. h.*, dorsal horn; *s. f.*, side fibril from axis cylinder of motor cell of ventral horn passing back into the hypothetical diffuse nerve network; *pr. proc.*, protoplasmic process of motor cell of ventral horn passing through white matter to blood capillary of pia; *bl. cap.*, blood capillaries (1) in the gray matter, (2) in the pia, with which the protoplasmic processes were supposed to be connected or related; *d. r. f.*, fiber of dorsal root sending branches into the gray matter to terminate in the diffuse nerve network; *Golgi cell Type II*, cell in the gray matter, its much branched axis-cylinder process helping to form the diffuse network; *sp. g.*, spinal ganglion; *per. s. f.*, peripheral sensory nerve fiber; *s. s.*, sensory surface; *v. m.*, voluntary muscle innervated by fiber of ventral root.

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nial nerves. The nerve cells in the posterior spinal ganglia, also the nerve cells in the corresponding ganglia of the cranial nerves, with their two expansions (one extending toward the periphery and the other inward to the spinal cord or

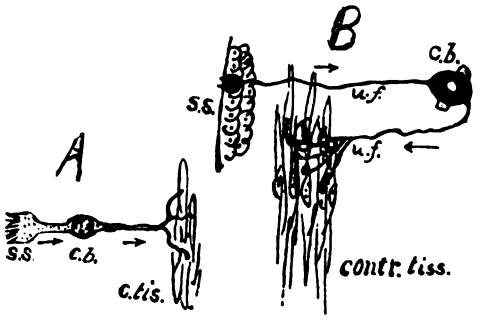

FIG 23. Lowest reflex types of neurons (hydra and medusa). A, neuron, (neuro-epithelial cell) of hydra, shown diagrammatically. B, neuron of medusa (a more highly developed animal).

brain), are afferent in their function,—they convey nerve impulses inward.

In this connection we may properly consider in a general way the functions of these three different classes of nerve cells. It is a property of all living matter, whether vegetable or animal, to respond to stimulation; indeed, it is due to this property that the animal is kept alive and enabled to carry on the different functions of its body. Nerve tissue, above all other tissue of the body, has the property of irritability; that is, it is capable of responding to stimulation. In the lower order of the animal kingdom, in the unicellular protozoa, the organized nervous system is not found, yet these minute unicellular bodies are capable of responding to different forms of external stimulation, one part of the unicellular organism responding quite as well as any other part. In these unicellular animals no organized nervous system is needed, for all parts of the body are equally sensitive to external stimulation. Passing to the next order of the animal kingdom, the metazoa, we find here a separate and distinct class of cells which make up the nervous systems of these little animals. These cells are bipolar in form,—they have two processes, one extending outward to the skin and the periphery, and the other process extending inward to the muscles and other structures. This bipolar cell is the only kind of nerve cell found in the body of the hydra and other animals belonging to their class. In the medusa, an order of animals a little higher in the scale than the hydra, but belonging to the same c ass —the metazoa —this bipolar cell is somewhat larger and more developed. Here, likewise, we have the two processes, one extending toward the periphery, and the other toward the central part of the body. See Fig. 23, A, B.

In these little animals the nervous system is extremely simple, yet sufficient to carry on all the work required of it. When contact is made on the exterior of the bodies of these animals, and perhaps by all other forms of stimulation (such as light, heat, etc.), acting upon the exterior of their bodies, a nerve current is developed as the result of this stimulation, which travels inward along the external process to the body of the cell, and after passing the body of the cell, extends still farther inward along the internal

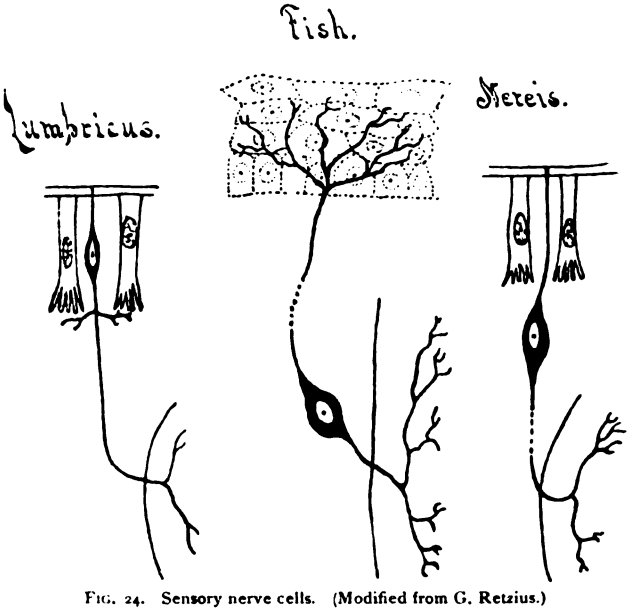

FIG. 24. Sensory nerve cells. (Modified from G. Retzius.)

process, finally stimulating the muscular fiber and bringing about a muscular contraction. This bipolar cell, which is first seen in the body of the lowly hydra, is the primitive form of nerve cell, and is present in the different species

of the animal kingdom, from the hydra up to man. Throughout the animal kingdom these bipolar sensory cells are very similar in their form and the distribution of their processes. In every instance one process extends toward the periphery for the reception of stimuli acting upon the exterior of the body of the animal, while the other process extends inward to the deeper tissues.

One of the principal modifications which has been observed in this class of cells in the different animals is the length of the process which extends to the periphery. In the lower order of animals, the hydra, for instance, this is short, and a striking peculiarity is observed, particularly in the earthworm, or *lumbricus*. In this little animal the body of the bipolar cell is situated in the integument itself, the peripheral process necessarily being very short, while the central process, which extends inward, is comparatively long. In another higher order of worm, in the nereis, for instance, Retzius and others have shown that the peripheral process of this bipolar cell is somewhat longer than in the lumbricus. (See Fig. 24.) Ascending in the scale of the animal kingdom, the peripheral process of this bipolar sensory cell becomes longer and longer, the cell body being placed deeper and farther within the body, and finally, in mammals, the highest order of the animal kingdom, we find the body of these bipolar sensory cells collected in groups to form the ganglia of the posterior spinal nerve roots, and the corresponding ganglia of the cranial nerves. These bipolar sensory cells (which form the great avenues, and, with the exception of the organs of special sense, the only avenues through which incoming nerve currents reach the central nervous system) in all probability respond not only to certain kinds of stimulation, such as that produced by contact with other bodies (as we are perhaps most likely to think), but, we have reason to believe, are sensitive and respond to nearly all other forms of stimulation that may act upon the body as well. It is well known, for instance, that the earthworm and other animals, although possessing no special sense organs (such as the eye, the ear, and the organs of smell), respond to light, to sound, and to certain odors when brought in contact with the surface of the body. We have abundant reason to believe that the bipolar sensory cells in man are likewise sensitive not only to contact, but to light, to change in temperature, and to electrical conditions, all of which are constantly acting and playing upon the sensitive nerve endings in the skin, bringing about reactions of different kinds in the internal organs of the body. Indeed, it is on account of this form of stimulation that the healthy nutritive processes are maintained, and the different organs of the body kept in action.

The importance of these various forms of external, and what we may term "physiological," stimulation on the human body is not appreciated as it should be; but the effect of removing or largely diminishing these various forms of stimulation upon the skin can be seen in a marked degree in prisoners, and others closely confined indoors and under bad hygienic surroundings, where the natural forces, like sunlight, and changes in the thermic and electrical conditions of the atmosphere, and other forms of external stimulation, are greatly diminished. The evil effect of the withdrawal of these natural and physiological stimuli may also be seen in certain diseases of the nervous system, where these bipolar cells which form the afferent pathways for incoming nerve currents are diseased, and thus the nerve paths intercepted so that nerve currents produced by these natural stimuli acting upon the skin can not reach the internal organs of the body. Thus the natural stimulation from these sources is to a greater or less degree cut off, and consequently, the machinery of the body runs at a lower rate of speed, and the vital forces and all of the nutritive processes are likewise lowered. Considering the matter from this standpoint, we are able to understand how hydrotherapy and electrotherapy, massage, and various other forms of rational treatment have produced such beneficial results upon the body. These various agents, by acting upon the nerves ending in the skin, set in motion, as it were, innumerable nerve currents which travel inward and affect the nerve centers in the spinal cord and in the brain. These various nerve centers have control of the different organs of the body, such as the heart, the stomach, etc. By modifying the action of these nerve centers, we are able also to modify the functions of the various organs.

(To be continued.)

GYMNASTICS WITHOUT APPARATUS.

BY J. H. KELLOGG, M. D.,
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THE most perfect system of physical exercises ever devised is probably the one known as Swedish gymnastics, chiefly the invention of Ling, a lieutenant in the Swedish army, who, having learned something, perhaps from the Chinese, and something from other sources, founded his own school in the early part of the present century. The writer has for many years been familiar with this system of gymnastics, having visited Stockholm for the purpose of investigating it. It possesses great value in the treatment of invalids suffering from various maladies, as well as in the training of the young. It requires, however, a skilled instructor, and while of inestimable service in securing general physical development, and correcting deviations from the normal standard of bodily symmetry, it must be admitted that for the ordinary requirements of hygiene, as regards the general effects of exercise upon the body, equally good results may be obtained from exercises which, from a scientific standpoint, may be technically less correct, and a knowledge of which may be acquired without any considerable effort and without the aid of a teacher.

FIG. 1.

After studying this question for a number of years, gathering hints from various sources, especially from the methods used by the Schott brothers in the treatment of affections of the heart, at Nauheim, Germany, the writer has formulated a plan for exercises which can be taken anywhere, and for the most part even in bed, without the aid of apparatus of any sort. If perseveringly employed, this system may be relied upon as a means not only of maintaining a healthy condition of the muscles and of the body in general, but of securing exceptionally vigorous muscular development.

Briefly described, these exercises consist of a systematic series of contractions and relaxations of all the groups of muscles in succession. To illustrate the fundamental principles of this mode of exercise in which no apparatus is employed, make the following simple experiment: —

FIG. 2.

Hold the arms at the sides with the palms upward flexed. Now bend the forearm till the hands are brought up near the shoulders. The amount of work done in this is very insignificant, and the movement might be repeated many times without producing the fatigue which is necessary to stimulate development, and thus produce increase of strength. But repeat the same movement, holding in the hands a moderately heavy book or weight. Observe the different sensation experienced in the arm. The muscles are at work. Tension is felt. A repetition of the same movement, still holding the book in the hand, will in a short time produce a sensation of fatigue or weariness in the arm. Now lay down the book, and repeat the movement, at the same time endeavoring to reproduce in the arm by an effort of the will the same sensation produced by lifting the weight. This is accomplished simply by producing a rigid state of all the muscles concerned in bending and straightening the arm. In other words, an effort is made to hold the arm straight, while at

FIG. 3.

the same time bending it. Before beginning the movement, the arm is made rigid while extended straight at the side. Then while maintaining the effort put forth to hold it rigidly extended at the side, the flexor muscles, or those which bend the arm, are energized to act to such an extent that they are able to overcome the movement which tends to straighten the arm. No weight is being lifted, but the flexor muscles are made to work the same as if they were lifting a weight, by the antagonizing action of the extensor muscles.

It will readily be apparent that the amount of work done by the muscles can by this means be regulated to a nicety. The flexors can be made to do as much work as can profitably be required of them. After the arm has been flexed, or bent, under resistance, the attention of the will toward the arm is changed so that it is made rigid in its flexed, or bent, position, while the extensors are compelled to straighten it.

FIG. 5.

Below is given a brief description of the several exercises which the writer has found useful. It will be evident that an almost interminable number of combinations may be made from these, by bodily attitudes or positions, whereby the work may be increased or diminished. The following general rules may be laid down as especially applicable to these exercises, as well as to many others: —

1. The will must be energetically employed in each particular movement. This effort for concentration of the will upon the muscular organs employed is a powerful factor in inducing development.

2. The acting muscles or groups of muscles must be continuously and regularly energized from the beginning of a movement to its end.

3. The movement begins with the part in its natural position, and ends when the part returns to that position.

4. As far as possible let the breathing be deep and regular while exercise is being taken, avoiding the tendency to hold the breath. This can not be altogether avoided; for it will be found necessary to fix the chest in many of the movements. There is no special harm in this, however, unless carried to the extreme. The muscles of the chest, as well as other muscles, must be fixed in order to be energized; and it is only when thus brought into full action that they are stimulated in such a manner as to secure development.

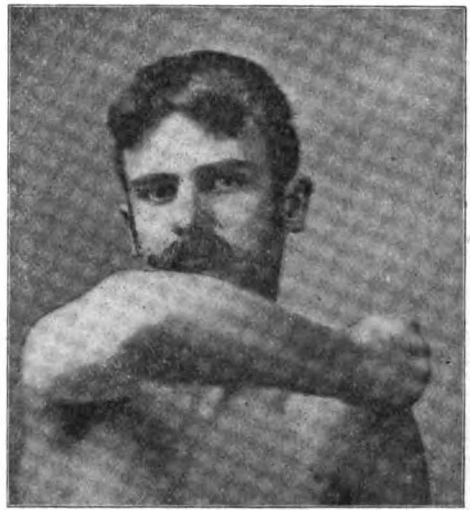

FIG. 4.

5. In general, it is better to repeat the exercises of a particular group of muscles not more than two or three times before passing to another.

6. After each movement of a group of muscles, rest a sufficient length of time to take a few deep breaths before repeating or beginning another.

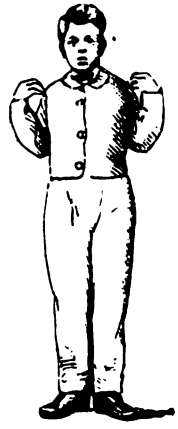

FIG. 6.

7. When beginning a series of exercises, care should be taken that the first practice be not too severe or prolonged. The exercises are so simple that the first impression will be that they may be continued almost indefinitely without marked effect; but unless this precaution is observed, the novice will experience on the day following his first employment of these muscles a very uncomfortable soreness. Probably no particular harm will result from this, hence the exercises should not be abandoned, but lighter movements taken.

8. After exercising a group of muscles on one side of the body, it is better to exercise the corresponding group on the opposite side before proceeding to another group on the same side. By this means the corresponding sides of the nervous system are brought into action symmetrically and practically simultaneously, and thus the most vigorous impression is made.

9. At first these exercises should be taken only once a day, but after a few days they may be taken two or three times to advantage. The time used in the exercises need not necessarily be so long as to make it a matter of inconvenience. Those who suffer from insomnia will find it advantageous to spend a few minutes with the exercises on going to bed at night, care being taken to make them very light, the purpose being to draw the blood to the muscles, and thus relieve the brain. In general, however, the best time is on first rising in the morning.

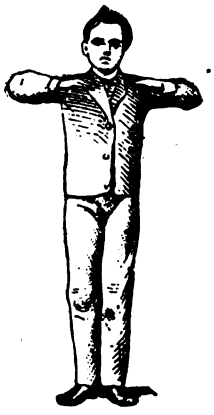

FIG. 7.

10. It is obvious that the exercises may be taken most readily when the body is hampered with but little clothing; but the ordinary clothing worn by men does not seriously interfere with the movements. The dress worn by women will not admit of taking the exercises in the proper manner, on account of the tightness of the waist, and the restricted movement of the shoulders.

11. When the extremities are cold, they may be very speedily warmed by means of these exercises applied with moderate vigor for five or ten minutes or repeated at short intervals. This method of warming the extremities is much to be preferred to artificial means, as it secures the desired object by balancing the circulation and withdrawing a portion of the blood from the brain or other parts of the body in which there is an excess.

FIG. 9.

12. Persons suffering from organic disease of the heart, or from any affection of the lungs which produces shortness of breath, may be greatly benefited by these exercises. In such cases they are more appropriate than any other exercise; but the movements must be executed in such a way as to avoid exciting the heart or lungs, a condition which will become readily apparent by quickened movements of the chest. In other words, the exercises should be taken in such a manner that respiration is not hastened. In these cases the further precaution should be taken to make but one movement with each group of muscles before proceeding to the next, or, preferably, bringing into action the corresponding group of the opposite side. The patient must not hold his breath while going through any movement. All the movements should be taken very lightly, and all "straining" must be carefully avoided.

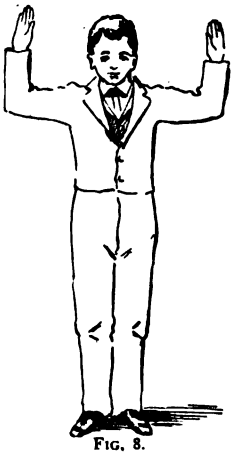

FIG. 8.

The following is a brief description of a series of movements which we have termed "Controlled or Self-Resistive Exercises:"—

Position.—In taking the following exercises, when not otherwise indicated, stand erect, taking pains to hold the chest well forward, and stand as tall as possible. The position should be such that it is possible, while standing perfectly erect, to rise upon the toes without swaying the body either forward or backward. When not otherwise indicated, the arms should be at the sides, reaching down as far as possible.

Each of the exercises is to be repeated from three to ten times, the number being increased from day to day.

For the Arm and Hand.

1. Fingers separating and closing slowly (Figs. 1 and 2).
2. Hand closing and opening.
3. Bending and extension of the wrist-joint.
4. Combine the preceding movements, beginning with abduction.

5. With the arms bending at the elbow and extending forward, twist the forearm so as to turn the arm down, then in the opposite direction.

6. Bend the arms upward to the position shown in Figure 3.

7. With the arms reaching downward, twist the whole arm, first in one direction, then in the other.

8. Fingers flexion, wrist flexion, forearm flexion, forearm extension, wrist extension, fingers extension, fingers abduction.

9. Flex the arm across the chest, as shown in Figure 4. Slowly extend the arm outward and backward (Figure 5).

10. Raise the arms slowly from the sides forward and outward. Slowly return to position.

11. Slowly raise the arms sidewise upward as far as possible. Slowly return to position.

12. Slowly bring the arms to position shown in Figure 6. Then carry the hands directly upward as far as possible. Reverse the movement. Slowly return to position.

13. Circumduction. Carry the arm from its position at the side while holding it straight, first in front of the body toward the left as far as possible, then carrying the hand upward to a vertical position over the head, continuing the movement outward, sweep extending backward as far as possible, finally bringing the arm back to position at the side. The arm should be kept rigidly extended and reaching outward as far as possible. The movement should be executed very slowly with first one arm, then the other. Repeat four times.

Note.— Execute the preceding finger and wrist movements, 1, 2, 3, while standing erect with the arm held in the positions indicated as follows:—

FIG. 10.

1. Arms at the sides, thumbs turned outward.

2. With the elbows at the sides, the arms half flexed, forearm extending forward, palms upward.

3. The position shown in Figure 7, palms downward.

4. The position shown in Figure 8.

5. Arms reaching forward, palms upward.

6. Arms reaching forward, palms downward.

7. Arms reaching outward, palms upward.

8. Arms reaching upward, palms forward (Figure 9).

FIG. 11.

For the Feet and Legs.

In taking the following movements, stand in the correct position, with the hands upon the hips, hands touching hips lightly, balancing the body upon one leg while

the movements are executed with the other.

1. Separation and closing of the toes.
2. Turn the foot upward and extend the toes.
3. Turn the foot downward and extend the toes.
4. Flex the leg, raising the foot backward as far as possible with the ankle extended.
5. Raise the leg outward, extending the ankle-joint. Return to position.

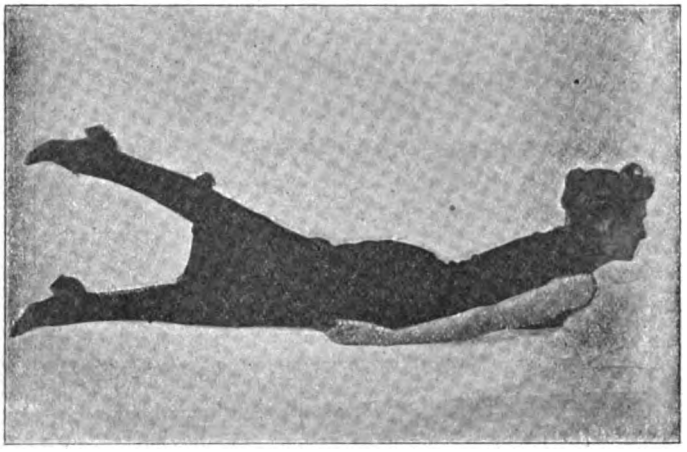

FIG. 12.

6. Raise the knee as shown in Figure 10, and slowly return to position.
7. Turn the toe outward as far as possible, then inward.
8. Raise the heel, allowing the toe to glide upon the floor, carry it across the middle line of the body as far as possible to the opposite side. Continue the movements until the toe rises upon the floor, then in a sweep upward and forward, raising the toe as high as possible while keeping limb extended, carry the limb outward and backward until the toe again touches the floor, then let the foot glide back into position. Maintain the trunk constantly in an erect position and the limb fully extended during the movement.

Exercises for the Head.

These exercises should be taken with the body in an erect position, the hands resting upon the hips.

1. Bending the head forward and backward, draw the chin in with as much force as possible.
2. With the chin well drawn in, bend the head alternately to right and left.
3. Twist the head to the left.

Exercises for the Trunk.

1. Standing with the arms reaching upward fully extended, bend alternately backward and forward.
2. With the hands resting upon the hips, bend alternately to left and right.
3. With the hands placed at the back of the neck, twist to left and right.
4. Lying upon the back, raise the head forward.
5. Lying upon the back, raise the leg upward, with foot extended.
6. Lying upon the back, raise head and leg together (Figure 11).
7. Lying upon the face, raise the head backward.
8. Lying upon the face, raise the leg backward. Also raise leg and head together (Figure 12).

Breathing Exercises.

1. Lying on the back, breathe deeply, expanding sides and abdomen.
2. Deep breathing, expanding the chest and trunk fully, and breathing out. Hold chest in position for complete expansion, drawing the abdominal muscles as vigorously as possible.
3. Empty the lungs, close the throat, and then execute the movement of inspiration by breathing in, raising the chest as high as possible. The effect of this is to draw the stomach and other abdominal organs upward (Figure 13).

FIG. 13.

4. Fill the lungs as full as possible, lightly percuss the chest at the sides, breathe out with firm pressure on sides. The purpose of this movement is to overcome the rigidity of the chest by increasing the elasticity of the cartilages connecting the ribs.

In taking these exercises, the movements should be voluntarily controlled; that is, in using the flexor muscles, resistance should be made by the extensors, and vice versa. By this means each set of muscles may be able to do as much work as is required for its healthy development, and a perfect balance will be maintained between the antagonizing muscles, and so symmetrical development will be secured. It should be remembered, however, that in order to secure results from this method of exercise it is necessary that the acting muscles be thoroughly energized; that is, the highest possible degree of tension must be maintained during the muscular movement, as shown in Figure 14, and the movement executed very slowly.

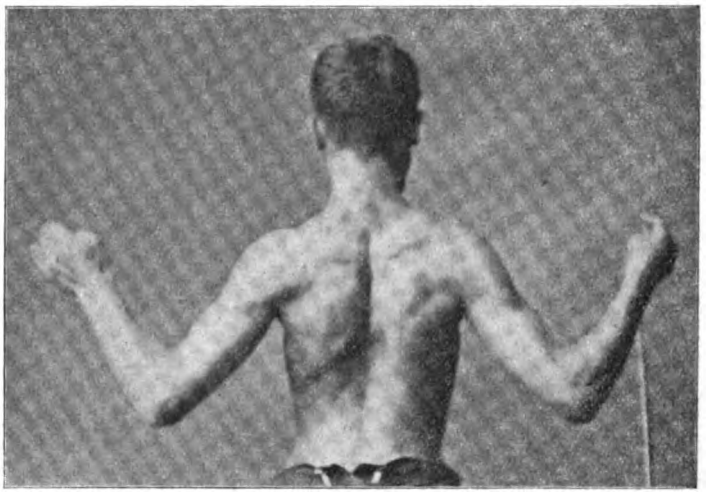

FIG. 14.

The movements should begin with the joints farthest removed from the trunk, and each group of muscles should be exercised in succession, until the trunk is reached. Care must be taken to bring the will to bear upon individual groups of muscles. The effect of this is not only to develop the muscle, but to bring it under the perfect control of the will.

THE TREATMENT OF CHRONIC MORPHINISM, WITH A REPORT OF FIVE CASES.

BY DUDLEY FULTON, M. D.,
Battle Creek (Mich.) Sanitarium.

THE treatment of this condition is of increasing interest to the medical profession since the occurrence of the habit within its own doors is becoming so frequent. Whether the estimate recently made by a well-known specialist that ten per cent of all the physicians in this country are addicted to the habitual use of morphine be true or not is difficult to determine, but such a statement is startling, even though it but approximate the truth. The investigation that has been stimulated by the above statement has served to call the attention of the medical and also the secular press to the evils consequent upon the free and ready prescribing of the drug. In the *Journal of the American Medical Association* for Jan. 6, 1900, mention was made of the increase in morphine sales as attested by forty-one out of forty-six druggists questioned on this point.

Greater caution and conservatism in its use are certainly needful. Much might be done by the united efforts of physicians in attempting to uneducate the people in the belief that they must have instant relief from every meandering ache that comes to them from either avoidable indiscretions or even to quiet honest pain.

It is unquestionably the duty of the physician to lessen pain, but danger results if he entirely forgets the office of pain, — that it is a plaintive voice warning of a condition more dangerous than itself. The busy practitioner in his very anxiety to answer the call of all, is often forced to give but superficial inquiry into the cause of the pain, and finds it easy and temporarily effective to quiet his patient with morphia. It has been the experience of all physicians that the habit of their patients had some such innocent beginning.

It is not in the province of this article to deal with the underlying causes of drug addiction — the hypersensitive, delicately organized individuals, and those of neurotic temperaments, — nor of the various

active causes, but rather to discuss the treatment of those who have been so unfortunate as to establish themselves in the habit of chronic morphinism.

The cure of such a person depends on more than the withdrawal of the drug. Relapses occur because patients forget this principle, and discontinue treatment too soon, to resume business life. The underlying cause must be removed, and the patient built up and restored so far as possible to his normal condition before a cure can be claimed. Success depends upon the ability of the physician to hold his patient until such a program is followed. It is the all-important period of the treatment. The withdrawal of the drug in cases where the patient can enjoy the benefits of a well-equipped medical institution is a comparatively simple matter.

It is not this period in the treatment that gives the physician the greatest anxiety in the cure of these patients, for he has learned that when properly handled, the patient is brought safely through ; but it is in the weeks and months after the drug has been withdrawn that there is danger of relapse. It is therefore essential that the physician make it a routine practice to study his patient and his physical condition so thoroughly that he can not only carry him safely through the ordeal of the withdrawal of the drug, but can outline the treatment and daily life of his patient during the period of convalescence.

To this end, in addition to the ordinary physical examination, the blood of the patient is studied, the urine examined, the strength tested, a test meal is given, and the stomach contents subjected to careful chemical and bacteriological examination.

The average user of morphine is also addicted to other allied habits. Usually he is either a devotee of tobacco or a user of alcohol, often both. The physiological effect of these various habits, combined with slow metabolism, as evidenced by diminished urea, sluggish bowels, overworked liver and kidneys, renders the task of the physician doubly difficult in the treatment of such cases. Hence such treatment as will asepticize the alimentary canal as much as possible and as will encourage the elimination of poisons from the body is indicated. To this end the patient is placed upon an aseptic diet consisting of kumyss, malted nuts, and fruit juices. Eliminative baths are given — by preference the electric-light bath, or the sweating pack — to increase the activity of the skin. Water drinking is encouraged for its beneficial effects upon the kidneys.

During this preparatory treatment the patient discontinues the use of all tobacco and liquor. It is needful for his future security that these habits be laid aside forever, as they are but links in the chain that binds him to borrowed felicity and comfort.

The withdrawal may be undertaken in one of three ways:—

1. By a sudden withdrawal.
2. By a rapid reduction.
3. By a gradual reduction.

No one method successfully cures all cases, as it is not the habit we are treating, but the patient. With the average patient the method of rapid withdrawal is adopted, as it insures greatest safety, lessened suffering, and the development of normal courage and strength.

Upon admission to the institution, the patient is examined and the preparatory treatment begun. This lasts from two to four days, according to the condition of the patient. The withdrawal of the drug is then instituted. The physician in charge administers all the morphia that may be given. Specially trained nurses are placed with the patient. The drug is reduced by giving each day from one third to one half as much as on the preceding day. With the average patient it is useless to delay the entire withdrawal longer than from the second to the fourth day, as the suffering is only prolonged, and all is over in a quick, sharp fight of from thirty-six to fifty-two hours. During this time the patient is fed on liquid foods,—malted nuts and kumyss,—which are nourishing, easily digested, and tend to maintain the normal amount of fluid of the blood. He is given sedative baths, at the temperature of the body, to allay the nervousness and irritability. The patient often falls asleep during this treatment. Local applications of galvanism and faradism, rubbing, massage, hot fomentations, etc., when skillfully applied, serve to alleviate the host of symptoms so apt to arise during this period.

For the nausea and vomiting and diarrhea which occasionally appear, relief is readily obtained by the administration

every two hours of the fluid extract of Coto bark in two- to four-drop doses, with bismuth subcarbonate in thirty-grain doses.

Something is being done for the patient every moment of the time to lessen the pangs of morphine hunger. Usually after the drug has been withdrawn, the patient sleeps well from sheer exhaustion. Later insomnia appears, and must be combated by rational means. The neutral bath and other hydrotherapeutic measures soon conquer this difficulty; the appetite returns; the patient gains in weight, and becomes quite himself, and usually needs to be restrained from getting on his feet too soon.

As stated before, the most critical period of treatment is now before the patient. His condition and his needs must guide the physician in the policy he adopts in each individual case.

The following is a report of five clinical cases: —

Case I.

Dr. ——, aged forty-nine, had used morphine for fourteen months to relieve intercostal neuralgia. Prior to coming here (July 16, 1899) he had made two futile attempts to cure the habit. On the date of his arrival he was using daily three grains of morphia, with atropin, hypodermically. He was forty pounds below his normal weight; had taken nothing but milk with limewater for six weeks; vomiting was frequent; he was weak and emaciated.

July 17: Patient slept well. Was given three grains morphia sulphate. Appetite poor. Diet of kumyss and malted nuts. Vomited twice; bowels inactive. Enema given with negative results. Treatment consisted of hot and cold applications to the spine, and a Swedish shampoo. Patient rested well.

July 18: Two and one-half grains morphia given. Appetite better. Patient placed in hot and cold trunk pack three fourths of an hour before meals, and left undisturbed until he was through eating. No vomiting. Bowels sluggish; soapsuds and oil enemas administered without results. Examination per rectum revealed fecal impaction. Patient was anesthetized and impaction removed. Treatment consisted of neutral galvanic electric baths, rubs, and stroking. Slept well.

July 19: Patient was given two grains of morphia. No vomiting; appetite good. Diet, kumyss, granose biscuits, malted nuts. Patient stronger. Treatment, galvanism to spine and legs, light massage, neutral bath. Patient slept five hours.

July 20: One grain of morphine was given. Appetite good; bowels moved twice; pulse strong and regular; patient restless.

July 21: Diarrhea; patient very weak, nervous, and irritable; appetite poor; heart regular; pains in knees, stomach, and bowels. Treatment, hot and cold trunk packs, hot enemas, Coto bark and bismuth solution to check diarrhea; neutral electric baths, ice bag being applied to heart while patient was in the bath. One-half grain morphia given. Patient slept three hours.

July 22: Appetite poor; patient restless; diarrhea; pains; strength good. Same treatment continued. No morphine was given. Slept two hours.

July 23: Improved; appetite good; bowels moved twice. Patient sat up in bed, and read for a half hour. Sedative baths and rubs constituted the treatment. Slept four hours.

July 26: Patient out in a wheel-chair. Appetite good; no vomiting. Diet was kumyss, malted nuts, granose biscuits, soft boiled eggs. At this time patient was sleeping five and six hours a night.

July 30: Patient gaining rapidly in strength and weight.

August 1: Had gained seven pounds in weight.

August 2: Slept poorly.

August 7: Improving; sleep broken; given cold wet-sheet packs before retiring, with good results.

Patient remained four or five weeks longer. The neuralgic pains completely disappeared. The total gain in weight was thirty-three pounds. His appetite was good, and all traces of insomnia completely disappeared.

Case II.

Architect, aged fifty-three. History of gastric ulcer, paroxysmal pain, vomiting, and severe hemorrhage of four years' standing. Nothing relieved the intense pain except morphia, which he had used irregularly for two years previously to admission for treatment. At this time he found himself addicted to the habit, although the amount used daily was small, one and one-fourth grains hypodermically.

Examination of the test meal revealed

an excess of free HCl. The patient was weakened and emaciated; appetite poor; insomnia; subject to intense paroxysmal pains in the region of the stomach at irregular intervals throughout the day; nausea and vomiting increased after meals; chronic constipation.

He was placed upon a diet of dry foods, — granose biscuits, almond meal, soft poached eggs, malted nuts, — which, with local galvanism to the epigastrium, a large dose of bismuth, and the application of ice over the stomach, did much to relieve the pain and vomiting.

Daily massage and hydrotherapy, faradization, and manual and mechanical Swedish movements were given to improve his general condition.

During this period of treatment, which lasted four weeks, morphia was withdrawn gradually, being given only to relieve the pain. The resulting insomnia and restlessness was relieved by rational measures. As a result the patient gained seven pounds in weight and his strength was greatly increased. The vomiting and pain were only occasional and light; appetite good; bowels still somewhat sluggish.

October 1: All morphine withdrawn.

October 2: Gastric pain and some nausea; more nervous and weak; obtained two hours' sleep. Treatment: Application of ice and galvanism to epigastrium; swallowing of bits of ice; neutral galvanic baths. Diet of malted nuts and milk with limewater.

October 3: Patient restless and suffering from pain, nausea, and vomiting; bowels loose. Slept forty-five minutes. Treatment: Larger doses of bismuth, with four-grain dose of extract of Coto bark. Patient greatly relieved from pain and vomiting by being kept in a hot and cold trunk pack for an hour or two at a time.

October 4: Small hemorrhage after vomiting. Patient weak; no appetite. Treatment: Placed in hot and cold trunk pack and given thirty-grain dose of bicarbonate of sodium in carbonated water. This gave almost instant relief, the patient sleeping for three hours. Further measures were rubs, neutral galvanic baths, and hot and cold applications to the spine.

October 5: Stronger, took and retained nourishment; slept six hours; no pain.

October 6: Able to sit up in bed. Slept five hours.

October 8: Occasional slight pain and nausea; appetite good. Out in wheel-chair.

October 10: Dressed and reading; greatly improved.

October 17: Felt quite himself. No evidence of former trouble excepting occasional distress in the epigastric region.

The patient remained under treatment until all evidence of gastric ulcer was entirely removed.

Case III.

Druggist of a neurotic temperament, aged thirty-five, had used cigarettes constantly since the age of sixteen. Had used large quantities of the bromides, phenacetin, caffeine, codeine, sulphanol, and chloral, and had gradually merged into the morphine habit two and a half years previously to admission for treatment; was using ten grains per day. He suffered from profound insomnia and obstinate constipation; had a jaundiced appearance; stools were clay colored. Patient stated that the influence of morphine always prevented sleep.

August 28: Patient admitted and given examination. Test meal showed a subacidity of the gastric juice. Patient was in a fairly good physical condition; area of liver dullness rather large; appetite poor; insomnia.

Given preparatory treatment of eliminative baths and an aseptic diet of fruits, kumyss, malted nuts, and vegetable broth.

Sleep was induced by means of the cold wet-sheet pack. His usual dose of morphia was diminished one third without producing any apparent effect. He smoked one cigarette. All other drugs, hypnotics, etc., were withdrawn.

August 29: Had four hours' natural sleep after the cold wet-sheet pack; appetite indifferent; strength good. Given only one-half grain of morphine.

August 30: Morphine withdrawn entirely. Patient restless; sleep broken; pulse full and strong. Given malted nuts and kumyss every four hours. Bowels loose. Given Coto bark and bismuth solution. Local galvanism and massage were administered to the legs, which were painful. Restlessness relieved by witch-hazel rubs, the neutral bath, Swedish shampoos, and light rubbing and stroking.

August 31: Griping pain in bowels. Slept three hours; stronger. Treatment continued.

September 1: Four hours of refreshing sleep; no desire for morphine; bowels moved naturally.

September 3: Sat up and read; six hours' sleep; appetite good.

September 7: Had gained four pounds in weight; out for walk; greatly improved.

From this time on, the patient made a rapid gain. He left feeling better than for years. He had gained eighteen pounds in weight, and the insomnia had entirely disappeared.

Case IV.

Dr. ——, aged thirty-five, suffering from gastralgia, contracted the habit two years before admission for treatment. He was at that time using from one to four grains a day hypodermically. He was a social drinker, and smoked moderately. Insomnia was present. Examination of the patient showed him to be in good physical condition. The method of sudden withdrawal was adopted at the patient's request.

June 26: His farewell dose was evidently a large one, as he remained in a deep sleep for twelve hours. The pupils were very much contracted.

June 27: Given liquid diet of kumyss and malted foods. Patient restless; griping pain in bowels and stomach; later in the day he vomited; bowels loose; patient suffering. Was given Coto bark and bismuth solution, which checked the bowels and relieved the pain somewhat. The neutral bath, fomentations to the stomach, swallowing bits of ice, and light massage eased the patient and allowed him two hours' sleep.

June 28: Broken sleep for four hours; pupils widely dilated; nervous, anxious, and weak; heart rapid, but pulse strong. Patient begged for morphia. Same treatment as on previous day continued.

June 29: Much easier; five hours' quiet sleep; bowels normal; appetite fair; strength improved.

June 30: Sat up in bed. In the afternoon was out on the lawn in a wheel-chair.

July 7: Felt very well; no discomfort. The patient continued to an uninterrupted recovery.

Case V.

Dr. ——, aged thirty-five, contracted the habit from the use of morphia in an attack of recurrent appendicitis and sciatica. He was using four grains daily, and smoking excessively.

Examination showed the patient to be in good condition physically. The drug was withdrawn suddenly.

First day: The patient had four hours' restless sleep; appetite was fair; strength good; respiration 18; pulse 66; temperature 98.4°.

Second day: Was given a diet of milk, poached eggs, and malted nuts. Treatment: Neutral bath, fomentations to the small of the back to relieve pain. Alcohol rubs and massage given. Bowels were loose; there was nausea. Hot enema given; also solution of Coto bark and bismuth. Patient weak and sleepless.

Third day: Patient very restless. Treatment the same. Diet, kumyss and malted nuts. Two hours' sleep was obtained.

Fourth day: Vomiting and diarrhea; respiration, 18; pulse, 62; temperature, 98.4°. Patient very uneasy and restless; sleep broken.

Fifth day: Treatment continued. Some nausea and vomiting. Patient improving. Short naps with sudden awaking from sleep.

Sixth day: Patient stronger; less vomiting. Electric bath given, and local faradization and fomentations to spine. Secured four and one-half hours' sound sleep.

Seventh day: More vomiting than on the previous day. Given large doses of bismuth. Sleep more broken. Diet the same, with the addition of gluten gruel. Respiration, 18; pulse, 72; temperature, 98.6°.

Eighth day: Improved; up and dressed; was taken out in a wheel-chair. Slept five hours. Appetite good. Some pain in bladder. Given tonic treatment.

From this time on the patient made gradual improvement until he was discharged cured.

Heat as a Hemostatic.— Heat, either in the form of actual cautery, or in that of water heated from 120° to 140° F., is a very excellent hemostatic under certain conditions. Demonstrations of the value of the actual cautery are seen in the operations for hemorrhoids, with the clamp and cautery. In large oozing surfaces, compression with towels in hot water is an excellent means of stopping capillary hemorrhage. — *Louisville Medical Monthly.*

TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

THE TREATMENT OF ABDOMINAL TYPHUS BY WATER IN THE CLINICS.

WINTERNITZ (*Blatt. f. klin. Hydroth.*, December, 1898) asks, "Since it has been proved that the Eberth-Gaffky bacillus has a direct or indirect causal relation to abdominal typhus, has there been any essential modification in the therapy of that disease? Has there been discovered any remedy capable of destroying the bacillus and the poisons produced by it, or of so changing the organism as to make of it a sterile fostering soil, thus making the development of the noxious substances impossible?"

As yet no healing serum or other specific remedy has been discovered for this disorder; and we still hold with the first and fifth congress held at Wiesbaden, Germany, that pharmaceutical preparations are often more detrimental than helpful. Cold water is to be recommended, and as yet there is no better, more efficacious, less offensive remedy in febrile disorders, especially abdominal typhus, than water.

A study of the most recent medical literature shows that the old idea that the treatment of febrile disorders by water is simply an antithermic procedure, still prevails to a large extent. The author is directly opposed to this theory, and as early as 1885 attacked it. He states that with the development of thermometry the increase in temperature was considered as a prevailing symptom of the fever, and that remedy decreasing, the temperature was regarded as antifebrile. The great etiological discoveries, especially along bacteriological lines, have convinced us that the fever process is not a mere antithermic condition, and the opinion of Schoenlein, rejected long ago, that fever is a reaction of the organism against the hostile parasites producing the disease, is again acknowledged.

The question arises, Must the therapeutist interrupt this healing procedure by means of his antipyretic methods which hinder the salutary increase of temperature? or shall he wait again till the fever, the microbes, and the organism fostering them, die of themselves? The answer to this question has already been given, years ago, by the great physiologist, Ludwig, who stated that the adherents of physical therapy will never render popular the good pathological and therapeutic experiments, although their statements may directly contradict the theory. A deduction from a pathological discovery is not sufficient for the therapy; the empiric investigations must first have confirmed it. The value of the therapeutics of fever is not to be estimated simply with reference to its influence on the temperature. The doctrine that the danger from fever is based almost exclusively on the hyperthermic condition, is one-sided. Gradually, however, experience has shown that not only on the increase of temperature and its consequences are the most essential dangers of fever based; in laboratories and clinics it has been learned that excessive heat and danger have no relation to each other. Naunyn has confirmed this experience, confirming the statements of Rosenthal that excessive heating to 43° produces sudden death in mammalia, probably by the development of stiffness of the heart and most other muscles. Temperatures fluctuating between 41° and 42°, and occasionally even increasing to 43°, were borne for several weeks without detriment, under the necessary precautions, by rabbits, which otherwise have little natural ability of resistance. That man may have no less power of resistance is to be presumed *a priori*, and has been directly proved by experiments in artificial overheating by Bartelo, Frey, and others.

The statement that man does not survive an increase of temperature over 42° or 42.5° has already been refuted by different persons; also that overheating is the cause of parenchymatous degenerations and fattiness of the various organs. Naunyn cites the experiments of Walther, Obermier, Lehmann, and Cohnheim von Recklinghausen against this opinion. That brain affections are not the consequence of the overheating is evident from the fact that in several forms of disease showing high temperatures, as in recurrent fever, such symptoms seldom appear. Besides, the gravest brain affections frequently appear before the temperature has reached a very high point, and often after a short period of fever. They are

also seen to disappear or to decrease under the influence of certain therapeutic measures, in spite of the increase of temperature.

It has also been observed that variations in the circulation, the heart, the quality of the blood, etc., are only in part due to the increased temperature. The increase of temperature itself is not always due to the same cause. On one hand, it is chiefly caused by heat retention; on the other, by variation of both heat production and heat loss.

The chief aim, however, in this disease, regardless of these facts, has been to secure remedies whose chief function is to lower the temperature. Mader has already asserted that the influence on the temperature does not affect the success of the antifebrile water treatment. He explains, in the alleged report (Yearly Report of the Infirmary, Rudolf Hospital, Vienna, 1870), his scruples about the principles of the present typhus treatment. He contradicts the affirmation that the high temperature alone is the cause of all grave symptoms, especially of brain affections and heart disorders. He contradicts the opinion that with the decrease of temperature the grave complications and the danger in typhus disappear. He considers high temperature a bad symptom, but the genuine cause of typhoid fever and the real danger he attributes to the infection, since he already noticed severe symptoms, as prostration, stupor, hemorrhagic decubitus, etc., in comparatively low temperatures. Mader regards the depressing effect of the typhus poison as of special significance in its action upon the vasomotor nerves. Consequently, by this depressing effect, the tendency, in typhus patients, to skin cyanosis, decubitus, hyperemia, pneumonia, catarrh of the lungs, pulsus dicrotus, seems to him to be explainable. The enlargement of the spleen can also be attributed only to a paresis of its vasomotor nerves. He believes that water treatment is certainly indicated if the vessel nerves are in a paralytic condition, since the water vigorously stimulates both the vessels of the surface and, by means of reflex action, those of the internal organs. Undoubtedly, however, the indications for the application of cold water would be essentially changed if we understood the effects of hydrotherapy in this sense.

Winternitz continues to explain as follows: "I have already proved in my former treatises concerning fever that the water cure in febrile infectious diseases does not only influence and control the effects of heat upon the human system, but that every clinical symptom can be directly and effectively influenced. Dicrotismus, heart weakness, and heart collapse can be cured by cold water, which powerful symptomatic remedy hydrotherapy furnishes. The supposition of Buchner that all auxiliary and protective agencies of the organism can be invigorated and even awakened by the water cure in order to keep off and overcome infections and intoxications, has been demonstrated by the scientific investigations and discoveries of myself and others." The author has demonstrated that in typhus, which differs from other infectious diseases in that a diminution of the white blood corpuscles can be observed, during a reasonably cold water treatment, and for some time after, the number of the white blood corpuscles was increased. The alkalinity of the blood showed an increase after each bath, also a reduction of the secretion of other toxic products.

Because of these facts the organism renders its healing serum more effective against each infection and intoxication under the influence of the water cure. The book of Curschman about abdominal typhus causes the author to put this question: "Are we really so rich in equally effective means that we are able to ignore entirely the above-mentioned progress and development of hydrotherapy, as prominent physicians in clinics do?" In a book of five hundred pages only five pages are given to the water cure, in which he calls it an antipyretic method. With reference to this, Winternitz replies as follows: "I have already protested against calling the treatment of typhus by water an antipyretic procedure. On account of an experience of forty years, I can not approve of the statement of Curschman, that the dietetic treatment and careful nursing of a sick person can make superfluous therapeutic cold treatment in mild, medium, and even severe uncomplicated cases, especially in previously healthy persons. Neither can the most skillful physicians decide beforehand that a case, the course of which is in the beginning mild or moderately grave,

will not soon change to a severe and complicated form. How will Curschman harmonize with the foregoing statement the statement made by him that 'one may not forbear treating with water grave cases showing symptoms of the intense effects of poison from the beginning,' according to the needs of the patient? Under these circumstances, the water treatment can not be compensated by any other remedy, and its forbearance and incomplete application is a great fault." Curschman explained neither the leading points concerning the choice of procedures and their effects, nor the reason why he would exclude mild and moderate cases from the water treatment. I have already demonstrated that in all probability the whole course of the process might become milder if one endeavors to awaken as early as possible the defensive and auxiliary powers of the organism against the infections and intoxications, since it is far easier to kill and remove the noxious substances from the organism in the beginning than in the later stage of the disease. If, however, one asserts that contraindications also exist against milder procedures, absolute and relative, we admit that it is not the manner of the application, but the symptoms to be overcome and the effect to be obtained, that are to be kept in view.

"If it is alleged that water treatment is to be strictly forbidden in the first signs of hemorrhage of the bowels, I can not agree with it, because enwrappings, local coolings by cooling apparatus, and leather bags are undoubtedly recommendable hydriatic procedures in such cases. Likewise, in peritoneal irritation, bandages to the abdomen or Priessnitz's bandage with cool leather bags may be very useful. I must directly contradict the statement that heart complaint is regarded as a contraindication against cold applications. That the thermal nerve irritation in his methodical application retards and invigorates the heart action, is able to reduce the peripheral impediments of the circulation, and to excite more intensively the nerves of the circulatory system by reflex increase of the innervation, and thereby could directly moderate and remove heart collapse and heart complaint, I have proved both theoretically and practically. Also arteriosclerosis and disorders of the valves of the heart, with or without typhus, can not be regarded as contraindications. Only want of experience can further regard greater pleuritic exudations as a contraindication. 'One should be very careful,' writes Curschman, 'with persons who suffered in former times with tuberculosis and bronchiectasis connected with tendency to bleeding and with grave emphysema.' But I have published many such cases where the typhus affection and its hydriatic treatment exerted just a good influence on the former affection.

"Further, Curschman asserts that 'full baths are used to-day for the most part, whereas the older methods are employed only as secondary remedies, or an imperfect compensation, where on account of individual or external reasons baths can not be employed.' This statement irrefutably proves that hydrotherapy has not yet been acknowledged in the clinics. I have often shown that full baths are a very imperfect method in every form of febrile disease, because a corresponding treatment of the skin surface, a corresponding augmentation of the heat loss from the body surface,—as this is possible in the so-called half-baths,—can be secured only with difficulty. Curschman's assertion that he applies only occasionally the so-called Ziemssen's gradually cooled baths, shows no exact clinical indication, for we have a strictly determined therapeutical method both about the temperature and the duration of the bath; and if Curschman applies his hot baths in the beginning for only ten to fifteen minutes, extending later to twenty or thirty minutes, I can readily believe that he exerts but little intensive influence on the central nervous system, the pulse, and the respiration, since he applies too high temperatures. Further, if Curschman applies at the most only four baths in twenty-four hours, it is very doubtful if this is sufficient for each patient, although I admit that it is very seldom necessary to apply more than four, at the best five, within twenty-four hours, provided that dietetic and hygienic means, especially fresh air, are sufficiently employed. It is the same logical mistake which all opponents of the system of the treatment of typhus by water make, that they submit only the grave cases to the thermal treatment, but regard this cure as improper in mild or less grave cases; because it is incredible that an agent that is successful in grave cases should not be

useful also in less severe cases. Curschman makes also another mistake if he expects that enwrappings, changed every two hours, could exert an antipyretic effect. The enwrappings as an antipyretic measure must not only be renewed once every two hours, but much more frequently; besides, it is nonsense to leave a feverish patient two hours in one enwrapping, since such treatment weakens the body, increases the temperature, and certainly would not exert an antipyretic effect.

"I must state, according to my experience of almost forty years, that but very few persons suffering with abdominal typhus die if a regular water treatment is applied. So far as I am concerned, I lost not a single one of such patients. I have already shown that the auxiliary and defensive powers of the organism, if they are really increased in order to resist the infection and intoxication, will be better able to master the noxious substances in the beginning of the disease than later, after all these micro-organisms and toxic substances have been developed in the bodily system. It is therefore entirely unreasonable to wait until the disease has proceeded to a state of degeneration, and we all have made the mistake of ascribing the effects of hydrotherapy in typhus to the antipyretic or antithermal influence of the water cure. Mader was the first who distinctly explained that the antipyretic effects of the decrease of temperature do not determine the value of the water cure. If increase of temperature is necessary to kill the noxious substances and poisonous materials in the organism, just the water cure, which decreases the bodily temperature very moderately compared with the pharmaceutical antipyretics, is a proper remedy. It was gradually shown both by myself and others, that one is able to exert a powerful influence on the course of typhus by removing the cause and symptoms of the disease by means of a methodical and regular water treatment. I believe, therefore, that the above-mentioned statement of Curschman must be generalized; that is, it is a great fault, not in grave cases alone, but in typhus altogether, if one does not apply the water cure.

The Rain Bath and Constipation.— In connection with an oration of Dr. Bovet, delivered before the Therapeutical Society, concerning the physical-dietetic treatment of constipation in stomach diseases, Dubois (*Gazette des Eaux*, 1899) outlines his position as follows: 1. The liver is enlarged in almost all cases of persons who suffer with disorder of the stomach, extending in the width of one to three fingers under the false ribs. 2. A great number of dyspeptic patients show a subicteric skin color, especially conspicuous in the palms of the hands and the tip of the nose, though the biliverdin is absent in the urine. 3. Fleury recommended douches applied to the liver in all neuropathic and especially hypochondriac patients, though the liver might not be enlarged, thereby effecting an excellent improvement of the nervous and gastro-intestinal symptoms.

Dubois recommends the following applications:—

A general cold or tepid rain douche, with a duration of ten to thirty seconds, according to the individual needs, to be followed by a cold douche applied to the liver, at a temperature of 57° F.; the patient being distant two meters from the attendant, elevates the right arm, placing the left arm upon the head. The douche may be either a spray douche or a percussion douche, applied directly to the liver, duration ten to fifteen seconds. After three or four sittings the patient becomes accustomed to this douche, though it may be a little painful in the beginning.

The good effect of this procedure is analogous to the treatment used by Dr. Berne in emptying the gall bladder, and thereby curing constipation. As a result of that douche applied to the liver, constipation, liver congestion, and all accompanying nervous symptoms very rapidly disappear.

SURGICAL SUGGESTIONS.

Dr. Bell (*Medical Herald*) gives the following suggestions:—

"Evacuate pus wherever found. To wait for the action of poultices to decompose the skin, or 'draw' the pus, is unworthy a modern surgeon.

"Immediate amputation of an injured member is now seldom required. Control hemorrhage, dress antiseptically, and await reaction.

"While the foregoing treatment will give by far the best results, altogether, it must be remembered that the danger from cardiac and pulmonary embolism is increased where an effort is made to save bruised tissues.

"A wise surgeon sacrifices no tissues that, if saved, would prove useful.

"Flaps, in order to heal kindly, must be free from tension.

"Err in making flaps too long rather than too short.

"In amputation, where bones are sawed, it is most difficult to keep thorough asepsis until the healing process is complete.

"Bandages should be adjusted so as to control hemorrhage from the stump after amputation, but great care must be taken to see that they be not drawn so tightly as to affect nutrition by obstructing the circulation.

"Unless there are indications such as rise of temperature, soiling of the dressing, or hemorrhage, a single dressing should suffice for an amputation.

"Do not inject cysts or vascular tumors with remedies tending to produce coagulation unless free drainage is provided.

"Cysts should be evacuated or dissected out, while vascular tumors are best treated by excision or by cutting off the blood supply.

"Varicose veins should be ligated at suitable points, and the intervening portion of the vein removed.

"Injecting varicose veins with astringents and irritants is unsatisfactory, and not without danger.

"Arteries and veins should be ligated with as little manipulation as possible.

"Esmarch's bandage has rendered operations upon bones almost as simple as upon the cadaver." — *Practical Medicine.*

The Prophylactic Value of Periodic Perspiration.— Ziegelroth (*German Medical Weekly*, Berlin, 1898) states that organic acids and aromatic products of putrefaction are not only expelled from the body by increased perspiration, but that micro-organisms are eliminated to a great extent. In a prepared bath of 200 liters, 240 germs to each cubic centimeter were conspicuous, and after the person had bathed, there were 400; in other words, in the 200 liters were found 80,000,000 germs, or about 32,000,000 more than before the bath; if, however, a patient covered with perspiration takes a bath, the germs are increased by 140,000,000. The difference in efficacy of the sweating bath in rheumatism and arthritis is thus explained. While the blood in the prodromal stage of rheumatism removes the acute peril by the excretion of the infectious germs, the blood serum in arthritis is getting more condensed by the excretion of one-half to one liter of tissue fluids, the separation of the urates is thereby alleviated, and the attack of arthritis accelerated and intensified.

The Treatment of Neuralgia and Rheumatism by Currents of Hot Air. — Wm. Taylor (*Lancet*, 1898) describes an apparatus constructed by himself which he calls the electrothermogen, adapted to the treatment of obstinate forms of neuralgia and rheumatism by means of currents of hot air. The air is put in motion by the aid of a fanning wheel turned by electricity, and is heated by conducting the same through a pipe in which wires are heated by electricity. The protracted application of air at a moderate temperature offers greater advantages than an application of shorter duration at a higher temperature. The apparatus can also be used for the cauterizing treatment of lupus by hot air, likewise for inhalations of evaporated substances, such as etheric oils.

Sun Baths.— Dr. Wilson (*Popular Science News*) says: Try them for the complexion, the circulation; for anemia and for sleeplessness, take frequent sun baths. He contends that sunlight is as necessary to the body as water, and that it is the best sort of tonic as well as a beautifier. He says: Take off all clothing, and sit or lie in a room flooded with sunshine. Change the position often enough to bring all parts of the body into the sun's rays. Tanning and reddening will not hurt the skin, but strengthen and improve it. This remedy, he claims, will invigorate the entire system, act as a preventive of colds, and improve the disposition by increasing vitality and strength.— *Practical Medicine.*

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

Effect of Quinine upon the Malarial Plasmodium.— Lo Monaco and Panichi (*Deutsche Medizinal-Zeitung*, Aug. 14, 1899) state that if blood containing young plasmodia is placed under the microscope and a few drops of a watery solution of sulphate of quinine (1:5,000) are added, it is observed that the parasites contract themselves by means of their pseudopodia, and the contained pigment tends to accumulate in the center. In about fifteen minutes the parasite again stretches itself, the pigment particles return to the periphery, and finally the plasmodium assumes once more its slow movement. In young but more developed forms, which occupy about two thirds of the erythrocyte and contain much more pigment, quinine pulls together the plasmodium and draws in the pseudopodia, so that the parasite attempts to assume a circular form; the pigment particles, which are found in large numbers at the periphery, become actively motile. Following this, all pigment particles gather in the periphery of the micro-organism, which assumes a round form. Soon after, it is noticed that the pigment particles move about, and the plasmodium emerges from the red blood cell and lies at its side. In the pre-febrile stage, the plasmodia, which practically fill the entire erythrocyte, do not emerge therefrom when in contact with quinine, but rather draw themselves together and then again stretch out, and finally assume a circular form, thus appearing much smaller. The movement of the pigment becomes very active, and it wanders from the periphery to the center of the plasmodium. When this movement has reached its acme, some of the pigment particles leave the parasite and deposit themselves at a greater or less distance from it. From these observations it is seen that on account of the quinine the plasmodia leave the red blood cells and thus undergo degeneration. Furthermore, they sanction the clinical rule that quinine is to be given always before the attack, and never during it.— *Medical Record, Oct. 14, 1899.*

Penetration of Bacteria into Eggs. —Bucco (*Rif. Med.*, Oct. 3–6, 1899), as the result of a series of experiments on this point, finds that many pathogenic bacteria, for example, staphylococcus pyogenes, Löffler's bacillus, etc., penetrate within the egg boiled at 100°, and are arrested either at the albumin, or even in some cases (proteus vulg., b. indicus, b. dipth.) reach as far as the yolk. Eggs cooked at 134° resist much longer. It was also found that many bacteria are able to penetrate the raw egg. The B. subtillis is not able to enter either the raw or the cooked egg. The B. dipth., although able to enter the egg cooked at 100,° can not penetrate the raw egg. The typhoid bacillus is able to enter the egg in twelve hours, and keep its vitality for four or five days. Seeing the kind of material and the places in which eggs are stored, these researches, showing that the eggs offer no insuperable barrier to the entrance of microbes, have some importance from a sanitary point of view, and form an additional argument for greater cleanliness in the storage of these valuable articles of diet.

Prophylaxis against Diphtheria.— Gabritschewski (*Deutsche Medizinal-Zeitung*, Aug. 14, 1899) mentions the following: (1) The bacteriological examination of the secretion of the mouth, pharynx, and nose must be undertaken not only in patients for diagnostic purposes, but also as a prophylactic measure in healthy persons who have been exposed to infection. (2) Infected persons, even though they are perfectly well, must undergo the same prophylactic measures as diphtheritic patients. That persons with a marked infection may appear perfectly well has been demonstrated by bacteriological investigation. (3) Patients who have been cured must not leave the hospital until the diphtheria bacilli have entirely disappeared. (4) In poorhouses, institutions, boarding houses, as well as in families in which a number of children under ten years of age are to be found, a thorough examination of the mouth, nose, and pharynx for diphtheria bacilli must be undertaken yearly, preferably in the early spring. (5) The general disinfection in diphtheria cases must be done after the disappearance of the bacilli.— *Medical Record, Oct. 7, 1899.*

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COLD WATER VS. MEDICINAL TONICS.

THE numerous medicinal tonics, so called, are universally toxic in character. Whatever tonic effects they may seem to produce, are due to the fact that the system is aroused to resist their influence and to expel them from the body; and while a certain amount of benefit is perhaps derived from the use of such agents, there is always a possibility of serious damage; and doubtless in all cases a considerable amount of harm is done through the toxic influence of the drug, which falls with especial weight upon those organs which are most concerned in its elimination,—the liver and the kidneys.

A medicinal stimulant is a mortgage placed upon the vital capital of the body, which must be paid sooner or later. It is a draft upon the constitution. A stimulant is simply a means by which the nerve centers are made to give up a little more of the energy which they have stored up; and unless the stimulus is of such a character that the storing power as well as the expending power of the nerve centers is increased, there must be a loss from its employment.

A toxic agent, like strychnia, may provoke the expenditure of nervous energy, but it does not replenish energy; while it does lessen the activity of the kidneys in eliminating tissue poisons, and the efficiency of the liver in the destruction of toxins and leucomains, thus encouraging the development and maintenance of a condition which is, in itself, an indication for the necessity of employing tonic measures; in other words, a medicinal tonic or stimulant aggravates the very condition it is intended to cure.

Nervous Energy.—The establishment in modern times of laboratories for psychological and neurological research has been the means of throwing much light upon the nature of mental and nervous activity. Nervous energy no longer means, as formerly, an intangible, mysterious something, but, as has now been clearly demonstrated, is immediately and definitely connected with material elements found in the interior of the nerve cell. For example, a nerve cell, when in a state of rest, shows a large number of grayish granules, which have been shown to be intimately connected with the storage of energy; so that when the granules are abundant, the cell is like a fully charged battery, ready to discharge under the influence of the right sort of stimulus the maximum of energy which it is capable of exhibiting. On the other hand, when the cell is fatigued, as after prolonged, energetic work, the granules are found to be very few and small, and the cells shrunken and pale.

With these facts in mind, it is easy to understand why such disappointing results have followed the use of strychnia and a very large number of medicinal agents, so-called "nerve tonics," since it is evidently impossible that these drugs should in any way increase the store of energy in the cell; and the most that can be expected from them is the excitement of the cell to activity when it has become exhausted to such a degree that a sense of fatigue supervenes as a warning that the store of nervous energy is reduced to a point where any further demand upon it is dangerous, and that rest is imperatively demanded.

The only way that the energy granules of a cell can be augmented is by the assimilation of food from the blood, and the development of energy-containing particles. Cold water surpasses all other

agents in its power to promote the normal energy-storing processes. Cold applications also facilitate to a very remarkable degree the discharge of nervous energy when a sufficient store exists, though sometimes it may not be available because its useful application is hindered by the influence of retained excretions or nerve-benumbing toxins generated within the tissues or absorbed from the alimentary canal. This effect of water is readily apparent in the influence of the cold bath upon muscular energy, to which attention is called elsewhere, and also in the sensation of well-being, buoyancy, and readiness for exertion which results from the application of cold water.

The tonic effects of cold water are unquestionably to a large degree due to the influence of cold impressions acting through the nerves of the skin upon the sympathetic nerve centers. The great sympathetic nerve controls the blood vessels, glands, heart, the functions of secretion and excretion, and, in fact, all the vital functions of the body. The awakening of the sympathetic to renewed activity, or a balancing of its action, is what is specially needed by the great majority of chronic invalids. The functions of the brain and spinal cord, and through them all forms of nervous activity, are to a remarkable extent influenced by the sympathetic. The sensation of well-being which accompanies the reaction following a general cold application is largely due to the increased activity of the cerebral circulation, brought about through the stimulation of the sympathetic. By its power to influence the sympathetic, hydrotherapy is capable of controlling, restraining, reorganizing, balancing, all the processes of organic life, and through them modifying the functions of animal life to a marvelous degree.

Cold Water a Physiological Tonic.—Cold water is a physiological tonic, and has the advantage over medicinal tonics of all sorts, in that it awakens nervous activity without the imposition of any extra burdens upon any vital organ, and without hampering the activity of any function. The cold bath employed in such a manner as to produce tonic effects accomplishes its results by increasing vital resistance to the causes of pathological processes, by making the wheels of life run more smoothly, by lifting the whole vital economy to a higher level. The impression made upon that harp of a million strings, the skin, with its vast network of sensory, motor, sympathetic, vasomotor, and thermic nerves, arouses every nerve center, every sympathetic ganglion, every sensory and motor filament in the entire body to heightened life and activity. Every blood-vessel throbs and every cell quivers with a new life; the whole body thrills with quickened impulses; the whole being is translated into a new state of existence.

A person who has never experienced the glow of exhilaration, the invigoration and buoyancy of body and mind, which accompany the state of reaction from a short, general cold application, can not well appreciate the value or significance of the cold bath as a physiological stimulant. It is not too much to say that it is of all measures known to man the most valuable as a means of arousing to activity the flagging energies of the body, and lifting the enervated invalid out of the morasses and quagmires of chronic disease.

MORPHINISM AND OTHER DRUG HABITS AMONG PHYSICIANS.

An impending and rapidly increasing danger which is lurking in the ranks of the medical profession at the present time is that of drug addiction. It is indeed alarming to note the rapidity with which such enslaving drugs as morphine, cocaine,

and chloral are claiming victims among a class who know full well the baneful effects of such drugs.

Statistical evidence concerning the prevalence of drug habits among physicians is given in a very excellent paper on "Morphinism among Physicians," by T. D. Crothers, M. D. From this paper, which was recently read before the New York State Medical Society, we quote as follows: —

"In a general history of 3,244 physicians residing in the Eastern and Middle States, and in some of the cities of the Western States, twenty-one per cent were found to be using spirits or opiates to excess. Six per cent of the number were addicted to the use of morphia or opium permanently. Besides this number ten per cent were using opium or other drugs secretly. Fully twenty per cent of the 3,200 odd persons, including the opium users, used spirits in moderation, so termed.

"In another study of 170 physicians, seven per cent used opium or morphia and six per cent were secret drug takers. From my own knowledge and from what I have learned from other physicians I believe that from eight to ten per cent at least of medical men are opium inebriates. That this is a conservative estimate may be assumed from the fact that all drug takers, and physicians in particular, are secretive and conceal this habit, particularly where it implies weakness, as is almost invariably the case, and reflects on their standing in the community.

"Dr. Elain states that a large percentage of physicians suffer and die from self-administered drugs. They begin to use spirits, opium, and other drugs for functional and transient disturbances, and later contract serious organic diseases, the early drug-taking having been a contributory cause. A physician who in middle life is excessively neurotic or neurasthenic, or who is rheumatic or has heart disease, neuritis, or chronic gastritis, is often suffering from the results of excessive spirits or drugs taken in early life.

"Morphinism among physicians is usually associated with the use of the drug by the needle, opium in the tincture and gum being used less frequently. The effects are the same, varying only in intensity and rapidity. Opium users are often alcoholic inebriates switched into a parallel road. After a period of uses of beer, wine, or strong spirits, the physician often turns either secretly or openly to opium. From this time his career is one of marked progressive organic degeneration. The tendency is toward imbecility, a low form of chronic invalidism follows, and acute fatal inflammations are always impending. The physician who uses opium is always serene and meditative in his manner. Except for an increasingly defective memory and degenerating ethical sense and irregularities of conduct, with a certain lividity of face, there is little to indicate his condition. The morphia maniac shows great extremes of emotion, at times being very talkative and sensitive to his surroundings; at times silent, indifferent, irritable, or violent in his impulses and speech. Morphinomania tends to acute mania and suicide.

"Morphinism is increasing among physicians. Private insane asylums show a percentage of medical men among the patients that is constantly growing larger. They are mostly young or middle-aged men, and are largely delusional therapeutists who must do everything by personal experience, or young men who have an exalted conception of the power of drugs, and believe that through them will come the physical millennium. The strain and stress of this latter-day existence is partly responsible, and I have known many cases where morbid curiosity has driven physicians to the use of morphine. Certainly it is one of the most fascinating and serious of modern diseases, this habit.

"In conclusion I would say to all physicians, Never use morphia on yourself by the needle, and never use it at all except by the advice of a brother physician. Never prescribe opium for a neurotic physician unless you are entirely certain that it is necessary and that no other drug will serve the purpose. Finally, if you are an opium user, make every effort to stop at once."

These paragraphs are pregnant with statements only too true, and the medical profession certainly owes Dr. Crothers a debt of gratitude for his painstaking efforts in securing this valuable information. We sincerely hope it will act as a stimulus to every member of the profession to arouse him to do all in his power to help his fallen brother rise and shake off the fetters of these enslaving agencies. In order to do his whole duty in this matter, the physician must not only lend his assistance in curing those already afflicted, but he must familiarize himself with the factors which are instrumental in producing the conditions that call for the use of such drugs.

It is the opinion of the writer that this rapid increase in the number of physicians addicted to the morphine habit is in a large degree due to the milder drug habits to which they have become addicted; namely, alcohol and tobacco. It is undoubtedly true that in some instances the drug is first taken for the relief of pain or sickness of some sort, but we believe the latter to be the cause of but a small percentage of these cases. It is a comparatively rare circumstance to find a physician addicted to the use of morphine who is not or has not been addicted to some milder drug,— in the majority of cases alcohol or tobacco, and frequently both.

Those who are most successful in the cure of morphinism and cocainism require the patient to give up the use of alcohol and tobacco before beginning treatment. Unless the patient is willing to abandon the use of tobacco and alcohol, and to co-operate with the physician, there is little use in his spending money and time in the fruitless search for relief. In the vast majority of cases of those who for a time have given up the use of morphine but still continue to use tobacco and alcohol, there is a relapse; the appetite for the tobacco and alcohol is not satisfied, and morphine is resorted to.

It should be borne in mind that it is the patient that needs treating, not the habit. Removing the morphine for a time is only removing a symptom. The condition which caused the appetite for the drug must be cured, which, as previously indicated, is frequently met with in alcohol and tobacco addiction. C. E. S.

REVIEWS.

LOVELINESS.—A story by Elizabeth Stuart Phelps. Houghton, Mifflin & Co., Boston and New York; The Riverside Press, Cambridge. 1899. Price, $1.00.

In this booklet of forty-four pages the author has in her pleasing and characteristic style pictured the mutual friendship which had sprung up between a beautiful invalid child and a little dog called "Loveliness." This friendship was more firmly established by the fact that the dog had been the means of saving the child's life. The two companions became inseparable. According to the story, all went well until by some mysterious and unknown agency the highly prized canine disappeared. Search was made everywhere by the child's father and others, including the president of the college in which the father was a professor. For weeks their search was in vain, but finally some one suggested that the dog had been stolen and taken to a medical school. The medical schools were searched at once, but no clue to the missing animal could be found. Finally the thought occurred to the professor to search the medical department of his own school. He was refused admittance, and it was only after obtaining the aid of a policeman that he was able to gain entrance through the guarded doors of the demonstrator's room, just in time to rescue "Loveliness" from the hand of the demonstrator, who was about to sacrifice the animal "without an anesthetic."

The Battle Creek Sanitarium
LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, M. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR DECEMBER.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
100 per cent	34	12	46
98 " "	2		2
95 " "	25	8	33
93 " "	28	12	40
88 " "	2	2	4
85 " "	6	3	9
83 " "	3		3
78 " "	4		4
73 " "	1		1
71 " "	5		5
Total	110	37	147

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	20	2	22
Between 4,500,000 and 5,000,000	54	8	62
" 4,000,000 " 4,500,000	18	21	39
" 3,500,000 " 4,000,000	7	3	10
" 3,000,000 " 3,500,000	4	3	7
" 2,500,000 " 3,000,000	4		4
Below 2,500,000	3		3
Total	110	37	147

Examination of Sputum.— There were 24 examinations made, 18 being new cases. Tubercle bacilli were found in 2 cases.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	17	41	1	50	5	13	23	28
Less than 10,000 bac	23	56	1	50	20	51	44	54
Between 10,000 and 100,000 bac					9	23	9	11
More than 100,000 bac.	1	3			5	13	6	7
Total	41	100	2	100	39	100	82	100

The patients were received from the following States and countries: Michigan, 17; Ohio, 10; Illinois, 8; New York, 8; Pennsylvania, 4; Iowa, 3; Wisconsin, 3; Minnesota, 2; Nebraska, 2; Montana, 2; Kentucky, 2; Missouri, 2; Indiana, 2; Texas, 1; West Virginia, 1; Arkansas, 1; Virginia, 1; Kansas, 1; Oklahoma, 1; California, 1; New Jersey, 1; Florida, 1; England, 1; unclassified, 7. Total, 82.

Urinary Laboratory.— Total number of specimens examined, 391; number of new cases, 205; number of cases having albumin, 15; sugar, 4; casts, 8; blood, 5; pus, 80.

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MODERN MEDICINE

VOL. IX. BATTLE CREEK, MICH., U. S. A., FEBRUARY, 1900. NO. 2.

ORIGINAL ARTICLES.

THE NERVE CELLS IN HEALTH AND DISEASE.

BY W. H. RILEY, M. D.,

Superintendent of the Boulder (Colorado) Sanitarium.

(Concluded.)

THERE is still another line of investigation which shows the close relation between these various forms of external stimuli and the healthy nutritive processes of the tissues of the body. It has been shown that when groups of nerve cells (for instance, the bipolar cells in the posterior spinal ganglia of man) become diseased, or when the posterior nerve roots in the lower animals are severed so that no nerve currents are allowed to pass inward over these cells and their processes to the nerve cells within the spinal cord,— these central nerve cells situated within the spinal cord (and which normally are in physiological relation with the bipolar cells of the posterior spinal ganglia) shrink and waste away, and in some instances entirely disappear. The reason, of course, for this retrograde change is the withdrawal of the natural stimulus which normally is brought to the cells by incoming nerve currents from the periphery traveling over the bipolar cells of the posterior spinal ganglia.

A healthy condition of the body depends in a large degree upon the natural forces acting upon the surface of the body, thus producing the afferent nerve currents which, traveling inward, act as a natural stimulus to the nervous system and in turn to all the different parts of the body.

These bipolar sensory cells, as we have already noticed, are the only kind of nerve element present in the hydra and the lower order of the animal kingdom. Farther up in the scale of the animal kingdom we find in the highest order of invertebrates and in the lower order of vertebrates another nerve element coming in to form the fundament of different nerve centers. In this class of animals, in addition to the bipolar cells which we have already mentioned, is another nerve cell, which forms the efferent side of the nervous system in all the vertebrates,— from the amphioxus to man. These two nerve cells are in physiological relation with each other, but in no sense do the fibers or branches of these different cells anastomose with each other. A nerve current passing along the bipolar sensory cell acts as a natural stimulant to the motor or efferent cells, and the nerve current is thus reflected from this last-mentioned cell to a muscle or to some other organ of the body. (See Fig. 25.) These efferent cells are present in all

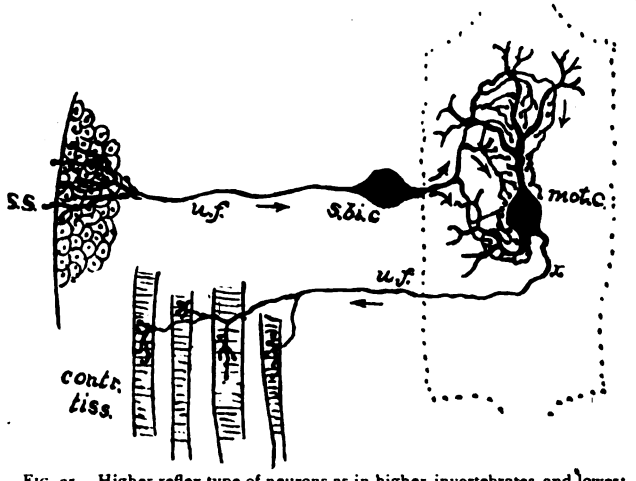


FIG. 25. Higher reflex type of neurons as in higher invertebrates and lowest vertebrates; *s. s.*, sensitive surface, in which the nerve fiber ends; *n. f.*, afferent nerve fiber, going to *s. bi. c.*, sensitive bipolar cell; [illegible], distribution of the nerve current in the direction of the arrows; [illegible], within the nerve center; *mot. c.*, motor cell from which issues at *x* another [illegible], *n. f.*, nerve fiber (efferent), which goes to *contr. tiss.*, contractile tissue. (After Andriezen.)

vertebrate animals, and furnish the only paths over which nerve currents pass outward from the central nervous system to the different organs and distant parts of the body. In man these efferent cells are found in the anterior horn of the gray matter of the spinal cord and the corresponding cranial nerve nuclei.

This class of nerve cells may be subdivided, according to the kind of tissue with which they are connected, into (1) motor, where the axis cylinders pass to the muscles; (2) vasomotor, those that control the action of the muscular coats of the blood vessels; (3) secretory, those which convey nerve currents to the different glands of the body; (4) trophic, those having control of the nutritive processes of the different tissues; and (5) inhibitory, those carrying nerve impulses that modify and inhibit the action of different organs.

In the nerve trunk efferent and afferent nerve fibers are mixed together, the different nerve fibers which make up the nerve trunk being bound together by connective tissue. On the outside, and surrounding the entire nerve trunk, we have a layer of connected tissue called the epineurium. The nerve fibers within the nerve trunk are collected together to form bundles. These bundles are called fasciculi. Surrounding each bundle, or fasciculus, is another layer of this connectve tissue, the perineurium. Passing within each of these fasciculi are strands of connective tissue called the endoneurium. Surrounding each nerve fiber we have first, the neurilemma, the connective tissue sheath which surrounds the individual nerve fiber; beneath this the medullary sheath; and within this the axis cylinder of the nerve cells, which is the part that conveys nerve currents. When the nerve trunk becomes diseased or is injured, both these kinds of nerve fibers (*i. e.*, the efferent and the afferent) are liable to suffer, as both are mixed together promiscuously within the nerve trunk. In a case of this kind we may have sensory, motor, trophic, vasomotor, and secretory disturbances.

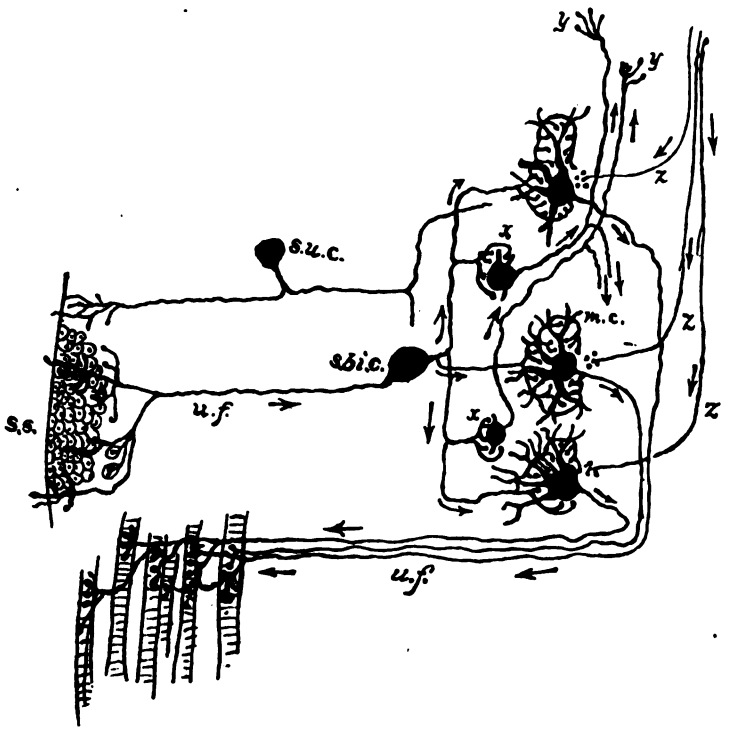


FIG. 26. Highest reflex type of neurons (spinal cord of fishes, amphibians, reptiles, birds, and mammals). *s. s.*, sensitive surface; *s. f.*, afferent nerve (sensory); *s. bi. c.*, sensitive bipolar cell; *m. c.*, motor cell; *u. f.*, efferent nerve (motor, etc.); *x*, other nerve cells with nerve fibers going to *y*; that is, to other parts of the nervous system. (These cells may be associative, commissural, or projective); *z*, nerve fibers coming from other parts. (After Andriezen.)

In the higher order of vertebrates, especially among mammals, we find still another class of nerve cells coming in to form the different nerve centers of the nervous system. In addition to the bipolar sensory cell, and the motor cell (the two classes which we have already noticed), there is a third class of cells interpolated between these two,—that is, between the afferent nerve cells on the one hand, and the efferent on the other. These are the central cells which we have previously referred to. (See Fig. 25.) We have already noticed that the function of the afferent nerve cells is to convey nerve currents to the central nervous system, and the function of the efferent nerve

cells is to conduct the nerve currents from the central nervous system to other organs and tissues of the body. The function of these central cells, which are placed between these other two classes, is to distribute nerve currents throughout the different parts of the central nervous system. By recalling the arrangement and distribution of the nerve fibers of the posterior spinal nerve root within the spinal cord, it will be seen that a single fiber comes into physiological contact with a large number of nerve cells within the spinal cord. The axis cylinder and collateral branches of each of these cells within the spinal cord in turn have physiological connection with a large number of other nerve cells within the spinal cord and brain. So each of these two classes of cells within the spinal cord may have connection with a large number of other nerve cells. Therefore it can readily be seen that a nerve current which enters the spinal cord or central nervous system over a single nerve fiber, when it reaches the spinal cord, may be broken up and distributed into a large number of nerve currents taking different paths, and perhaps be distributed to widely separated parts of the nervous system. It is on account of the arrangement and large number of these central nerve cells that an incoming nerve current may be thus widely distributed throughout the nervous system. It is also on account of the function of the central cells that, from a single stimulus which may act upon a peripheral sensory nerve, we may get varied and different reactions in different animals, or in the same animal at different times and under different conditions.

As has already been noticed, in the lower order of animals this group of central nerves is entirely absent. In the lowest order of animals with a nervous system, we have simply the one kind of nerve cells,—the bipolar sensory cells. Higher in the scale we have the two classes of cells,—the bipolar sensory and the efferent. The next important change noticed is the appearance of the last-mentioned class of nerve cells,—the central cells. (Fig. 26.) When these central cells first make their appearance in the scale of the animal kingdom they are comparatively few in number; but they become more and more numerous as we pass from one order of animals to the next higher, and when we reach man, we find that this group of central cells is very large in number. It is important to get clearly in mind that in man this central group of nerve cells includes all the nerve cells of the nervous system except the afferent (represented by the bipolar sensory cells of the posterior spinal ganglia, and the corresponding cells on the cranial nerve root) and the nerve cells forming the afferent pathways for the special senses, such as the eye, the ear, etc., and the

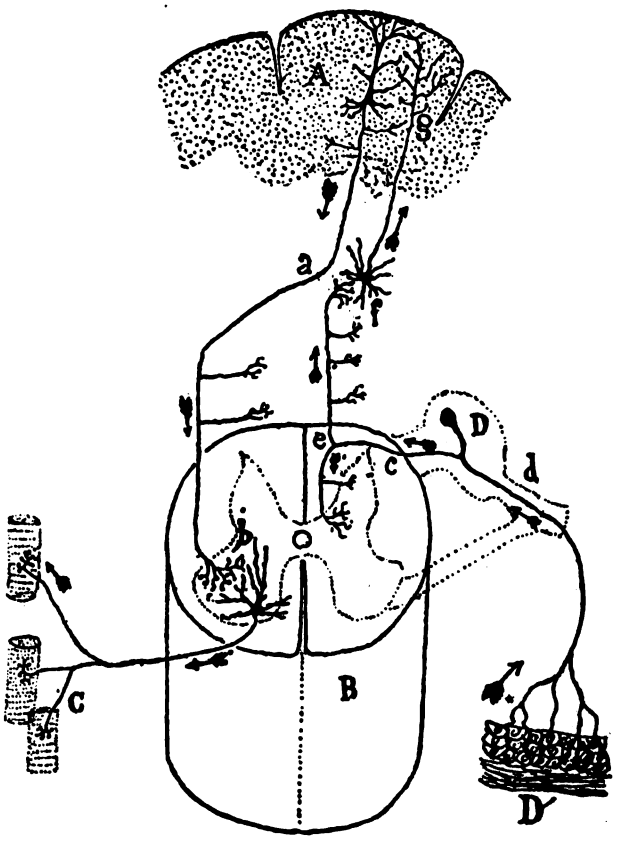


FIG. 27. Schema of the course of voluntary motor incitations and of conscious sensory excitations; A, psycho-motor region of the cerebral cortex; B, spinal column; C, muscular fibers; D, spinal ganglion; D1, skin. The current of the motor impulse originates in a pyramidal cell of the psycho-motor region of the brain; A descends along the axis cylinder (*a*) of that cell, passes to a cell of the anterior horn of the spinal cord by means of the terminal arborizations of the axis cylinder (*a*), and ends in C in several muscular fibers, after having traveled through the axis cylinder of the spinal motor cell. *a*, axis cylinder of projection cell in cortex.

other class, the efferent, represented by groups of cells in the anterior horn of the gray matter of the spinal cord and the corresponding cranial nerve nuclei.

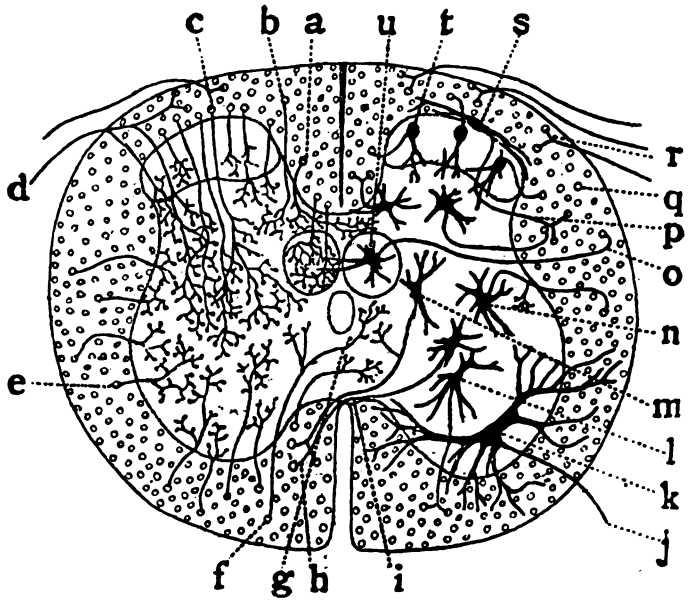


FIG. 28. Schema, representing a section of the cord with the relations of its various elements, according to modern discoveries. *a*, collaterals of the column of Goll which forms the largest part of the posterior commissure; *b*, collaterals of the same column leading to the posterior horn; *c*, collaterals of the posterior column reaching the gray central substance, some of which extend to the anterior horn; *d*, radicular stem and its collaterals; *e*, collateral fibers of the anterior column; *f*, collaterals which contribute to form the anterior commissure; *g*, their passage into the commissure; *h*, axis cylinder coming from a commissural cell, which, after having participated in the anterior commissure, goes to the anterior column; *i*, passage of this axis cylinder in the commissure; *j*, axis cylinder passing directly to the anterior root; it starts from *k*, motor cell of large size; *l*, cell which sends its axis cylinder to the anterior column with its axis cylinder bifurcated; *m*, cell with commissural axis cylinder; *n*, cell whose axis cylinder gives collaterals for the connections; *o*, axis cylinder of the cell of the column of Clark; *p*, axis cylinder coming from *s*; *q*, transverse section of an axis cylinder; *r*, bifurcation of radicular posterior fibers in ascending and descending branches; *s*, marginal cell of the substance of Rolando; *t*, small cell of the same substance; *u*, body of cell of column of Clark.

This central group of nerve cells therefore includes all the nerve cells of the cerebral cortex and the cerebellum, together with the nerve cells making up the basal ganglia of the brain, besides a large number of other cells scattered throughout the central gray matter of the spinal cord and brain stem. These central cells may be subdivided into certain groups, according to the parts of the nervous system with which they connect. In the first place, we have two general divisions of these central nerve cells: (1) association cells, those which connect or join different parts of the nervous system on the same side; and (2) commissural, those that connect parts or opposite sides of the nervous system. The association cells may be divided into three classes; (a) projection cells, cells that connect one part of the nervous system with another; for instance, those connecting the brain with the cord, or *vice versa*. (See Fig. 27.) This class of nerve cells has very long axis cylinders, some being forty or fifty centimeters or even more in length. They are represented by such cells as some of the pyramidal cells of the cortex of the brain, which send their axis cylinders down through the different parts of the brain and down through the spinal cord to connect with the motor cells in the anterior horn of the gray matter of the spinal cord. It is the axis cylinders of this class of nerve cells that make up what is known as the long nerve bundles in the spinal cord, or the fibers of the pyramidal tracts, the cerebellum tract, etc. The next class of association cells may be termed (b) the interganglionic. They connect different levels of the nervous system with each other; in other words, different centers within the spinal cord, or different centers within the brain. The third class of association cells are (c) intraganglionic. This class of association cells do not send their axis cylinders outside of the gray matter, but connect with different elements within the same nerve center. They are represented by Golgi's second class of nerve cells, those with a short axis cylinder.

Connections are made between different levels of the spinal cord and brain stem by the axis cylinder of the interganglionic nerve cells and commissural cells, as follows: In a nerve cell in the spinal cord, the axis cylinder grows out into the white substance of the cord, and here it turns at quite a sharp angle, and extends in some cases upward, and in other cases downward, passing in a longitudinal direction through the white substance of the spinal cord. Throughout its entire length it gives off collateral branches at right angles, which pass back-

ward into the gray matter of the spinal cord to come into contact with the protoplasmic branches of nerve cells situated there. Finally the end of the axis cylinder itself turns in and divides into a number of fine branches, the so-called end arborization, and surrounds the protoplasmic process of the cells in the gray substance of the cord. In other cases the axis cylinder of these interganglionic association cells passes outward into the white substance and divides into two main branches, one extending upward and the other downward. From each of these two main branches, collaterals are given off which pass back into the gray substance of the cord, and end free in contact with the protoplasmic processes of the nerve cells in the gray substance of the cord. The end fibers of the main stems of the axis cylinder end in the same way. In the spinal cord these interganglionic association cells are found scattered throughout the greater part of the gray matter of the cord, in the anterior horn in the central gray matter, and in the posterior horn of the gray matter of the cord.

The axis cylinders of the commissural cells in the spinal cord and brain stem have the same arrangement as in those of the interganglionic just described, except that the axis cylinder crosses the median line and here forms an elbow with the main branch, continuing in a longitudinal direction either upward or downward; or again, the main stem, after crossing the median line, may divide into two longitudinal branches, one extending upward and the other downward, each of these giving off collateral branches which extend backward into the gray substance of the cord. See Fig. 28.

The axis cylinders of these interganglionic association and commissural cells are found in that part of the white matter of the cord nearest the gray matter. Their axis cylinders do not extend for any considerable distance upward or downward in the cord; consequently, when the spinal cord is cut in two, as is sometimes done in experimenting upon the lower animals, we do not find any long tracts of degenerated fibers close to the gray matter of the cord, either above or below the point where the spinal cord is severed, because the axis cylinder of the nerve fibers in this part of the white substance of the cord is, for the most part at least, made up of nerve fibers coming from the interganglionic or commissural cells which connect different centers in the spinal cord that are comparatively near together; consequently, if degeneration is found after the spinal cord is severed, it is only for a short distance either above or below the point of division. On the other hand, the fibers making up the long tracts of the cord, such as the direct and cross pyramidal tracts, the cerebellar tract,

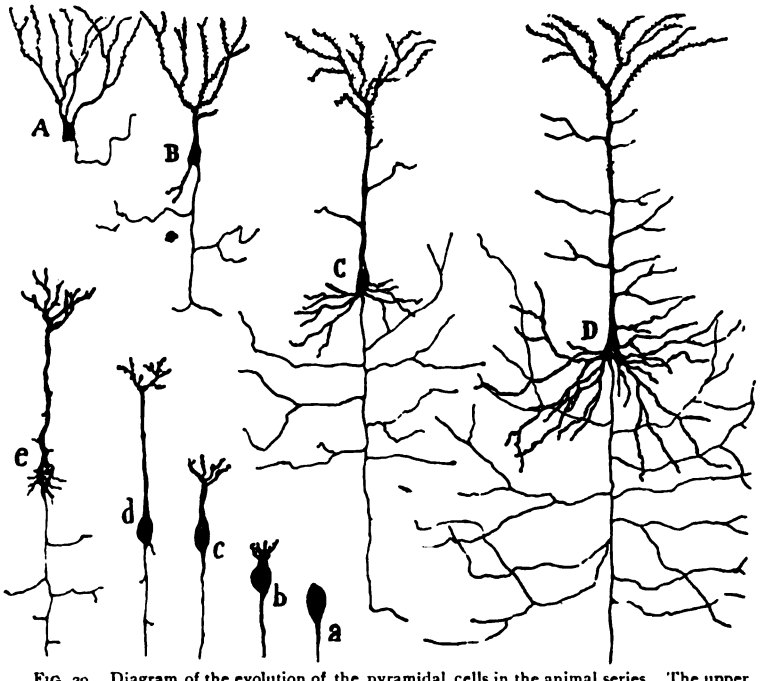


FIG. 29. Diagram of the evolution of the pyramidal cells in the animal series. The upper group of cells shows the psychic cells in various vertebrates. A, frog; B, mouse; C, newt; D, man. The lower group indicates the evolutionary phases undergone by the psychic or pyramidal cell of the brain. a, neuroblast without protoplasmic processes; b, beginning of protoplasmic processes and terminal filaments; c, protoplasmic processes more developed; d, appearance of collateral branches of axis cylinder; e, formation of protoplasmic projections from the cell and the protoplasmic processes.

and Goll's tract, are, most of them, situated in the outer part of the white matter; and when fibers of these long tracts are severed from the body of the nerve cell, they degenerate, and the degeneration can be followed for a considerable distance through the cord. The fibers constituting the axis cylinders of these long tracts belong to the so-called projection cells before described.

Following is a brief recapitulation and classification of the nerve cells of the central nervous system: —

NERVE CELLS OF THE CENTRAL NERVOUS SYSTEM.

1. *Intrinsic*, those nerve cells the body of which is within the bulbo-spinal axis or neural tube.

2. *Extrinsic*, those nerve cells the body of which is outside of the bulbo-spinal axis or neural tube (bipolar cells of the posterior root ganglion and corresponding ganglia of the cranial nerves).

Intrinsic Cells: —

a. Central.

b. Efferent.

a. Central:

1. Projection: Those the axis cylinder of which connects brain and spinal cord.
2. Interganglionic: Those that connect different parts of the spinal cord or different parts of the brain on the same side.
3. Intraganglionic: Those that connect different elements of the same level.
4. Commissural: Those that connect opposite sides of the brain or spinal cord, either at the same level or different levels.

b. Efferent: —

Those that conduct nerve impulses outward to muscles, etc.

These are: —

1. Motor.
2. Vasomotor.
3. Secretory.
4. Trophic.
5. Inhibitory.

Extrinsic (afferent in function): —

Sensory.

Excito-Reflex.

Sensory: —

1. Nerves of special sense.
2. Nerves of common sensation.

There are two striking features in the finer anatomy of the nervous system of man as compared with that of the lower animals. One of these is the large number of central nerve cells found in the central nervous system of man, and the other is the large number of processes given off by the nerve cells. Both of these peculiar features furnish a means by which the number and course taken by nerve currents passing through the nervous system can be greatly multiplied, and affords one explanation, at least, why the reactions and other activities of the nervous system of man as the result of external stimulation are so much more complicated than in the lower animals.

Figure 29 shows a comparative number of nerve fibers in a frog, a mouse, a newt, and a man. It will be seen that the number of processes attached to the body of the nerve cell gradually increases as we ascend the scale of the animal kingdom. This illustration shows also the changes that a nerve cell goes through in the course of its development. The axis cylinder grows out first, after this the protoplasmic process, and finally the collaterals grow out at right angles from the axis cylinder.

(To be continued.)

THE RATIONAL TREATMENT OF INSOMNIA.

BY J. H. KELLOGG, M. D.,
Superintendent of the Battle Creek (Mich.) Sanitarium.

SLEEPLESSNESS is not in itself a disease, but an indication of some morbid condition which interferes with the natural processes of tissue repair afforded by complete suspension of the voluntary functions and slowing of the involuntary functions during sleep. The normal amount of sleep required for the average individual is at least eight hours. It is a mistake to undertake to perform for any considerable length of time either physical or intellectual labor with a smaller allowance. Such a practice is sure to be visited by the physiological penalty in later years. "Whatsoever a man soweth, that shall he also reap" is a truth that finds no exception in the hygienic rules upon which the integrity of the body depends, and especially those which relate to the processes whereby recuperation and repair are accomplished.

In dealing with cases of insomnia, it should be borne in mind that this symptom may be the precursor of some grave organic disease. It is one of the earliest symptoms of insanity and of various structural changes in the brain, though not in itself a cause of these disorders. Clinical observation has shown that it is possible for a person to live without sleep for about the same length of time that life may be maintained without food; namely, three to four weeks. Persons who claim they have not slept for six or eight weeks, or longer, and are still fairly well preserved, are mistaken with reference to the facts.

In the treatment of insomnia it is not so important to relieve the insomnia itself as to relieve the cause, and it is generally far better to allow the patient to lose one or two, or even three or four, nights' sleep, than to induce sleep by such harmful means as chloral, opium, and other drugs of like nature. The treatment of insomnia by means of hypnotics, once popular, is falling into discredit among observing and experienced medical men, especially neurologists and alienists. It is certainly refreshing to see this rational principle so well recognized by such distinguished men as C. K. Clark, M. D., professor of mental diseases of the Queen's University, London; Reynold Webb Wilcox, M. A., M. D., LL. D., professor of medicine and therapeutics at the New York Post-Graduate Medical School and Hospital; Alexander Mc Phedron, M. D., professor of medicine at the University of Toronto; Donald Mc Allister, M. D., F. R. C. P., of the University of Cambridge; Henry Barnes, M. D., ex-president of the British Medical Association; J. O. Brookhouse, M. D., physician of the general hospital, Nottingham, England; and many others of equal eminence.

In the treatment of insomnia, it is necessary to remove, so far as possible, all the causes of sleeplessness. The use of tea, coffee, tobacco, alcohol, and drugs of all sorts must be abandoned. The diet must be simple, nourishing, and non-stimulating. The free use of flesh foods, by encouraging uric acid accumulation and increase of arterial tension, as shown by Haig, tends strongly to produce sleeplessness. Flesh food, if taken at all, should be used sparingly; but it may better be proscribed. Meat should never be eaten at the evening meal. It is best to eat but twice a day, and nothing later than four or five o'clock P. M.; or if a third meal is taken, it should consist exclusively of fruit.

After a careful study of this matter in hundreds of cases and an experience in the employment of the two-meal-a-day plan for more than thirty years, both personally and as applied to many thousands of patients, the writer is convinced that the popular notion with reference to eating late at night, and especially respecting the value of this measure as a remedy for sleeplessness, is an error. The ancient Greeks and Romans ate twice daily, and the two-meal-a-day plan is at the present time the prevailing practice of mankind. There are, in fact, but few nations among whom the practice of eating more than twice daily is common.

It is true that the taking of food just before retiring, and sometimes even in the middle of the night, is recommended by some authors as conducive to sleep, and it will be conceded that sleep, even by the aid of a light meal, is much better than no sleep at all; but it is a well-known physiological fact that perfect sleep can not be obtained while the digestive process is active (Landois and Sterling). There is a close relation between the solar plexus and the cerebrum. The excitation of the plexus reacts upon the cerebrum, and maintains a degree of activity just sufficient to prevent the absolute rest necessary for perfect recuperation. During sleep the arteries of the brain are contracted while the lymph spaces are filled, a condition conducive in the highest degree to prompt repair, while disintegration is diminished. The excitation of the mesenteric vessels and the congestion of the portal circulation occasioned by the stimulation of gastric activity without doubt to some degree drains the cerebral circulation; but at the same time the activity of the solar plexus created by the digestive processes reflexly excites the activity of the cerebral cells, and so interferes with one of the conditions necessary for complete rest and repair.

The several conditions necessary for sleep are lessening of blood pressure, accumulation of lymph, and the suspension of reflex excitation. Many persons can be made to sleep by simply closing the

eyes and ears, thus shutting off external stimuli. The wet-sheet pack and other hydriatic procedures accomplish the same result by diminishing the reflexes from the skin.

Digestive activity during sleep diverts a portion of blood from the brain into the great portal reservoir, and thus secures in part the conditions favorable for sleep, but at the same time, by exciting the activity of the cerebral cells, renders perfect sleep impossible.

The sensation of "goneness" of which many of these patients complain, and which is certainly conducive to wakefulness, is not true hunger, but an indication of a state of gastric irritability and sensory disturbance of the gastric mucous membrane manifest only when the stomach is empty and when its hypersensitive walls lie in contact. That this condition is not due to hunger is evident from the fact that it is most pronounced a few hours after a meal, usually four to six hours, or about the time the stomach usually empties itself into the intestine. Patients who complain of most distressing "goneness" at night, but who can be induced to retire without eating, with very rare exception rise in the morning finding the symptom has disappeared; whereas, if it is relieved by taking food, as it may be, it is present in an equal or even increased degree on waking in the morning. The patient feels miserable and distressed until after he has eaten, not because he is so greatly in need of food, but because of the mental and nervous disturbance growing out of the reflex irritation of which the gastric mucous membrane is the starting point.

In a large proportion of these cases an unpleasant sensation of goneness may be relieved by making the patient drink freely of water, or he may be allowed to take some stewed or ripe fruit. Strongly acid fruits should be avoided. Any bland substance whereby the gastric walls may be separated will usually afford relief. One or two glasses of cold water well charged with carbonic acid gas is perhaps the best of all remedies for this condition. The quieting effect upon the stomach is well shown in the readiness with which hiccough and gastralgia may often be relieved by a draught of cold carbonated water. If necessary, several draughts of carbonated water may be taken during the night. The advantage of fruit over other foods is the fact that if well ripened or cooked, it will be digested within an hour, thus leaving the stomach free; and as it contains little or no proteid, the gastric glands are not excited to secrete hydrochloric acid to any extent, so that the mucous membrane is not irritated as by the digestion of proteid substances. If other food is to be taken, there is nothing better than buttermilk, kumyss, kumyzoon, or matzoon. Milk in this state leaves the stomach in a short time; whereas raw milk, or even boiled sweet milk, forms curds in the stomach which may leave it only at the end of several hours, especially in cases of gastric dilatation, and are likely to give rise to the formation of gas by fermentation, and may even encourage the development of putrefactive processes, the evidence of which is shown in the bad taste and coated tongue experienced by the patient in the morning after taking raw milk at bedtime or during the night to induce sleep. This is especially true in cases in which dilatation of the stomach exists.

Most digestive disorders which give rise to insomnia may be relieved by a dry, aseptic dietary. The free use of fruit encourages renal activity, which aids in producing sound sleep by the more perfect removal of the products of tissue activity.

Bouchard showed that spasm-producing toxins are produced in the body much more actively during sleep than during the waking hours, and that the urinary toxicity is greatly diminished by out-of-door activity. This shows the importance of vigorous exercise as a means of inducing sleep, but the exercise should not be carried to the extent of producing prolonged exhaustion of the nervous system. Sleeplessness after violent exertion is a common experience. Moderate exercise, continued long enough to produce gentle fatigue, with slight perspiration, is highly conducive to soundness of sleep. Exercise of this sort taken for half an hour in the evening, followed by a warm bath (95° to 92°), will obviate the necessity for hypnotics in more than half the cases of insomnia.

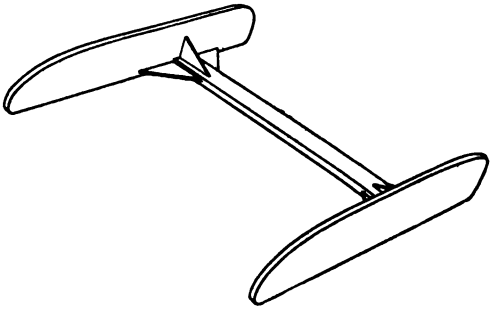
The sleeping room should be cool (about 60°), and the bed clothing should be warm, but not too warm. The bed itself should consist of an air mattress or a good hair mattress. The covering should be as light as possible with comfort, consisting of woolen blankets rather

than comfortables. Air or hair pillows should be employed. Feather pillows as well as feather beds should be regarded as relics of past ages. In cases in which cerebral congestion is a cause of insomnia, a sort of hammock pillow may be constructed, consisting of a piece of ducking a foot in width stretched upon a frame between two uprights about two feet apart. The accompanying figure shows a device of this sort which can be easily adjusted. From personal experience, the writer has found this to be a very excellent means of promoting sleep. It is especially useful in cases in which compresses are applied to the head.

The nightdress should consist of a long gown reaching from the neck to the feet, made of some soft and non-irritating material, such as canton flannel or a heavier wool fabric with canton flannel lining. If the feet are inclined to be cold, long, heavy bed socks lined with canton flannel or linen mesh should be worn.

A hot-water bottle may be placed in the bed a few minutes before the patient is ready to retire. On the whole, the hot-water bottle tends to produce general chilliness, and to awaken the patient by overheating after he has once gone to sleep, so it should be avoided if possible. If, as is sometimes the case with neurasthenics, there is vasomotor relaxation with a sensation of burning, this may be relieved by means of a bag filled with ice water and placed between the sheets at the foot of the bed.

Perfect quiet should be secured. A rattling window sash, slapping curtains, snapping steam coils, noises from vines rubbing against the house, and other sources of annoyance must be suppressed. It is sometimes necessary to stop the ears of the patient, especially in cases in which there is hypersensitiveness of the auditory nerves. This may be easily done by either one of two simple means. A thin strip of absorbent cotton, three or four inches in length, and an inch and a quarter in width, may be smeared with vaseline, rolled tightly together, and made to retain its form by twisting the ends slightly. This cotton plug should be pressed into the auditory canal as far as possible without touching the membrani tympani. Its introduction may be facilitated by grasping the external ear between the thumb and finger and lifting it slightly upward and backward. The outer end of the plug should be spread out in the concha; more vaseline should be applied, then a mass of cotton as large as the fist, and a bandage over the whole. By this means external sounds may be almost absolutely excluded. Sealing wax, such as is used by expressmen in sealing packages, may likewise be conveniently used. It is only necessary to warm the end of the stick, squeeze off a piece the size of a hickory nut, then when the mass has



cooled sufficiently to prevent burning the tissues, but is still plastic, it may be pressed into the external auditory canal and spread out in the concha, being made to fit the tissues tightly everywhere. Shutting out all external stimuli by thus completely closing the ears and by also closing the eyes, which sometimes must be done for the patient, will often result in almost immediate sleep. It is sometimes wise to tie over the eyes a bandage of some thin, dark fabric, such as a black veil folded.

The bowels must receive regular attention. The coloclyster or the graduated enema should be employed daily. The patient should drink freely to encourage the activity of the skin and kidneys, and to aid in removing toxic substances.

The patient should retire at a regular hour, preferably by half past nine or ten, or earlier if favorable conditions can be secured, even if he should feel no inclination to sleep. He should not engage in any exciting physical or mental occupation during the evening. It is especially important to avoid study or work requiring any considerable degree of mental exertion. Cares and worries should be dismissed from the mind, and if the mind remains active, it should, if possible, be fixed upon some monotonous subject, such as counting. Deep breathing sometimes promotes sleep. An excellent plan is to practice very slow deep breathing, counting the breaths.

(To be continued.)

PREDISPOSING CAUSES OF DISEASE.

AN ADDRESS BY PROFESSOR BOUCHARD,
Basle, Switzerland.

It is understood that we must seek out the causes of disease; yet it is not the direct causes of sickness, but the indirect causes that we ought to recognize. We should study the predisposing causes of disease, for without these the exciting causes are often without results. The predispositions of many families render them peculiarly susceptible to certain affections.

A close study of indirect or predisposing causes of sickness impresses upon one the fact that these causes are persistent in their nature, while exciting causes are sudden, unforeseen, and ephemeral. When such is the case, it is difficult to reach the hidden causes and to control the disease. As an example, I would cite the power of cold to occasion certain diseases. Cold is an exciting as well as a predisposing cause of disease, and against which as an exciting cause we can not make much headway; but there is a certain something against which we can fight.

If you have this conception of disease, you can foresee the diseases by which an individual may be attacked; you can fearlessly present the future of such an individual, for you know that he is liable not to one disease only, but to a whole series of diseases otherwise dissimilar; as, for example, the secondary action of cold in causing neuralgia, paralysis, pleurisy, bronchitis, etc. As to its clinical form or its evolution, the predisposing cause is unique, but the diseases which it produces are multiple, each one having its own character. We are able to battle against continued causes; we can attenuate this morbid disposition by submitting the patient thus marred to a special régime, and thus affect not only the person under treatment, but his descendants. It is on this point that the doctor is powerful, and by knowing how to discern the future menace he succeeds in showing himself the minister of the art of medicine.

Conscientiously, we can not say that we heal; in reality, in acute diseases we do not heal; but if we can prevent these diseases, the rôle of the doctor is already considerable. But we do heal such chronic diseases as, if left alone, would not heal of themselves. With regard to acute diseases, their natural tendency is to get well; the doctor aids the process, but nature does the work. He is a witness in the combat between the system and the microbes. He can help nature by furnishing to her the necessities which she could not produce, or which she produced in insufficient quantities under the influence of the morbid cause. In this case we borrow from another organism the necessary substance which is there produced naturally. It is thus that we do in administering the serum for diphtheria. Chronic disease is but the continuation of a morbid cause acting on the organism, a condition which can not end in health because the organism is put into such a state that it is vulnerable to the action of a certain microbe, the system not being able successfully to combat it.

We all receive, moment by moment, the agents of infection, but we have not all this morbid predisposition, and very often a leucocyte arrives and destroys the first invader; but if once we do not successfully resist the first invasion, we shall not resist subsequent ones. We can lessen this morbid disposition by appropriate preservative and curative treatment. Certain it is that in chronic diseases we heal by combating the cause itself. When, for example, we have to do with a syphilitic or a person afflicted with malaria, we fight the direct cause, the microbe; but in a general way our treatment is preventive. One sees the efficacy of the treatment especially in certain cases of migraine, where the disease disappears when the dyspeptic state, the cause of this condition, is treated.

I believe that nine tenths of the migraines are of dyspeptic origin, produced by a primary intestinal intoxication. The effect may be made to disappear by the administration of caffeine or antipyrin, but the cause remains. The patient feels his pains immediately lessen, but they rarely disappear entirely; often they reappear more violently than ever. But what we must endeavor to do is to prevent a return of this crisis, and to secure this it is necessary that all putrid fermentation be expunged from the intestinal canal during digestion. If we can make the dyspepsia disappear, we heal the migraine.

Along this line of thought I have already given other examples. The abuse of alcohol and lead poisoning determine nervous pains equally. The presence of putrid substances in the intestinal canal has a lethal effect on the nervous system. Microbes which are on the surface of the air passages, for example, can thus produce bronchitis, nasal catarrh, pneumonia, etc. Furunculosis, which ofttimes is present with obstinacy in cases of diabetes, disappears of its own accord when the intestinal fermentation which causes it is remedied. The treatment of biliary and uric lithiasis resolves itself into the elimination of humors from the body and from the blood in particular. The troubles of nutrition result in a diminution of the alkalinity of the blood. When this is remedied, the disease itself disappears. Attacks of gout are rendered less intense and of shorter duration when the general nutrition is changed by a modification of diet, coupled with repose of the nervous system, without which it is difficult to combat.

We must understand these predisposing causes. They all depend upon a change in the functions of one or several organs, which itself depends on a change in the structure of this organ or with the nervous excitation of this organ in consequence of an anatomical alteration. These nutritive changes depend not only on the modification of the structure of the organ, but on all causes which change the living substance, be it physically, chemically, or dynamically.

All diseases in which the cells elaborate poisons are able to modify the composition or architecture of the molecule; then this modification may take place in every cell in the body. Moreover, changes are produced, apart from disease, by that something in a patient which causes his substance to differ from a perfectly healthy man; this produces the changes. Possibly the cause is to be found in his ancestors, or in his prenatal existence.

When one considers the nervous system and the influences which impress it, he finds that not only nervous diseases, but all sorts of diseases, result from weak nerves. When an individual is fatigued, infectious diseases develop with the greatest facility, so that if he but pass from the shade to the sunshine, he will sneeze from one to ten times, then have coryza, bronchitis, etc. An individual who has a depressed nervous system will have congestion of the lungs from causes which would not be noticed in those of robust physique. If a person has a tendency to purpura, anger causes hemorrhage of the gums and mucous membrane. It is not rare to see a relapse in diabetes because of a violent temper. The cause disappearing, the diabetes disappears also.

REPORT OF THREE CASES OF SECONDARY CARCINOMA OF THE LIVER WHICH APPLIED FOR TREATMENT AT THE MEDICAL CLINIC OF THE A. M. M. C. DISPENSARY, CHICAGO.

BY WILLIAM B. HOLDEN, M. D.,
Chicago, Ill.

Case I.

History.— Mr. B., aged fifty-seven, a lawyer, married, had served in the United States army, was a hard worker, but used tobacco and alcoholics at times. One year ago he noticed an uneasiness in the abdomen. His health gradually failed, until he was quite prostrated a few times with severe pain in the abdomen. In June, 1899, he had a severe attack of pain, and took considerable whisky for relief. At this time enlargement of the liver was discovered. From then until his death he was more or less incapacitated for business. About November 1, ascites, swelling of the legs, difficult respiration, and insomnia appeared.

Examination.— Examination revealed emaciation, marked cachexia, slight icterus, and considerable dyspnea. The lungs showed signs of edema; heart irregular, weak, and rapid; liver greatly enlarged, the surface rough and nodular, some of the nodes being distinctly umbilicated; liver very tender in places. Urine showed uric acid, but no albumin, casts, or sugar.

Mr. B. died December 12. An autopsy was held by the writer. Examination of the abdomen only was permitted. The liver weighed eighteen pounds. It was everywhere studded with whitish, hard nodules, varying in size from that of a pea to an orange. Many of the larger masses were black, soft, and upon section showed a smooth, homogenous, structure-

less, dark reddish-brown pasty substance. The pancreas revealed the same condition as the liver, the entire organ being involved. The lymphatic glands around the capsule of Glisson were indurated and enlarged. The kidneys showed beginning interstitial nephritis. A few white nodules the size of a pea were found on the anterior surface of both kidneys, the right at its contact with the liver, the left where it approximated the pancreas. The spleen, stomach, gall bladder, and intestines were normal.

The ante-mortem diagnosis of cancer of the liver was confirmed by the post-mortem findings, and in addition, judging from the more advanced state of degeneration in the nodules in the pancreas, the primary lesion was located there, followed by secondary carcinoma of the liver and kidneys.

The hemorrhagic degeneration in some of the nodes suggested the possibility of melanotic sarcoma, but no primary focus could be demonstrated. A microscopic examination of the tissue confirmed the diagnosis of carcinoma.

Case II.

Mrs. M., aged fifty-nine, appeared in Dr. F. X. Walls's clinic Dec. 14, 1899.

History.— Widow, Irish; cook; mother of nine children, only two living; used beer and whisky; had always worked hard. She had experienced occasional pain in the left side for several years. In August, 1899, she had 'bloody flux" for a few days, and again November 15, the bowels remaining loose, moving three or four times daily. Weakness, difficult breathing, cough, and soreness in the abdomen appeared.

Examination showed cachexia, anasarca, ascites, icterus, and nodular enlargement of the liver; temperature, 97°; pulse, very weak and rapid; hemoglobin, 87 per cent; urine, specific gravity, 1.029, and contained bile.

Diagnosis.— Carcinoma of the liver.

December 21 the patient died.

Autopsy by Dr. Walls revealed considerable subcutaneous fat; abdomen full of dark serous fluid; specific gravity, 1.014; right lung compressed and right pleural cavity completely obliterated by strong adhesions; lungs everywhere studded with hard nodules varying from the size of a pin head to a bean; heart, small; myocardium, soft and flabby; liver, enlarged, nodular, and adherent to omentum; masses in liver varied greatly in size. There was one white hard mass about six inches in diameter. The center of the larger nodes was soft and caseous. The liver weighed about fourteen pounds. The stomach was dilated, the spleen and pancreas normal. All the lymph glands along the vertebræ were enlarged; small white mass was found in the left broad ligament; kidneys, small, cystic, granular, obscure; cortical markings and adherent capsule. Three inches from the anus there was a hard, irregular constriction of the rectum, and white nodules in the wall of the bowel.

Anatomical Diagnosis.— Slight atelectasis of right lung; fatty degeneration and infiltration of myocardium; schirrus carcinoma of the rectum; carcinomatous retroperitoneal glands; carcinoma of left broad ligament; very large carcinomatous liver; chronic interstitial nephritis. Specimens were preserved, but no sections have been made.

Case III.

History.—Miss P., colored, aged thirty-six, appeared in Dr. Walls's clinic Dec. 18, 1899. Dressmaker; parents died of old age; several brothers and sisters died of tuberculosis; she had always enjoyed good health. Last sickness began the latter part of August, 1899, with indigestion, constipation, frequent micturition, progressive weakness, and loss of weight. Occasional paroxysms of severe pain under left shoulder suggested the presence of gallstones.

Examination.— Examination revealed icterus, enlarged inguinal glands; temperature, 99.8°; pulse, 105; ascites; edema of legs; liver greatly enlarged and nodular; slight friction fremitus over liver; indeterminate mass in hypogastric region.

Diagnosis.— Carcinoma of liver, possibly as a sequela to gallstones.

Patient died Jan. 6, 1900. Autopsy held by the writer. Examination of abdomen only was allowed. Abdomen was distended with several quarts of clear fluid. The peritoneum over the right side contained scattered white pinhead-sized nodules. The liver extended from the third interspace above to the crest of the ilium below; the substance of the liver was everywhere filled with hard white masses from the size of a pea to that of

an egg, mostly of the smaller size; weight of liver about fourteen pounds. The gall bladder was normal and contained no solid particles. The stomach, pancreas, and kidneys showed no changes. Arising from the mesenteric side of the sigmoid flexure of the colon was a hard mass as large as a small egg, which projected into the lumen of the bowel, obstructing its caliber fully one half. It had a relatively small pedicle, and presented a cauliflower-like appearance as viewed from the inside. On the cut surface a small amount of yellow caseous material could be scraped off. The retroperitoneal lymph glands were only occasionally indurated. The kidneys presented no changes.

On the anterior inner surface of the right ilium there was a dense almond-sized mass. On the cut surface it showed a very firm fibrous structure. Connected with the right ovary was an oval, fairly symmetrical cyst extending one inch above the umbilicus. The cyst contained a greasy fluid. The walls of the cyst were friable, and on the inside were covered with a large quantity of fatty sebaceous material. No hair or teeth were found. A like cystic mass as large as an orange, arising from the left ovary, was found posterior to the uterus. The contents of this cyst were fat, oil, and sebum. The uterus was small; the spleen soft, shriveled, and only one-half normal size.

Anatomical Diagnosis.— Primary carcinoma; sigmoid flexure of colon; secondary carcinoma of the liver; small fibroma on right ilium; large dermoid cyst of right ovary; small dermoid cyst of left ovary.

The number of different neoplasms, the age of the patient, and the malignancy of the carcinoma are the interesting features of this case.

The above cases all presenting themselves at one dispensary in the course of a few days and their autopsies obtained inside of a month form a rather remarkable coincidence.

Syphilis as an Etiological Factor in Tabes.— Dr. Chas. Dana stated recently before the New York Academy of Medicine that in seventy-five to eighty per cent of cases of tabes a genuine history of syphilis is obtainable.

The Influence of Alcohol on Infant Feeding.— Bunge, of Basle, in an address before the Seventy-first Annual Meeting of the German Association of Scientists and Physicians (*Phila. Med. Jour.*, Oct. 21, 1899), began by showing that the composition of mammalian milk keeps steady pace with the development of the animal. The more rapidly they grow, the greater the percentage of proteids and salts in the milk. Further, the percental composition of the bodies of young animals agrees closely with that of the milk destined for them. From this it comes that we can not substitute one milk for another without injuring the infant creature. This is supported by practical experience in the case of giving cow's milk to babes. By artificial feeding, babes are regularly overfed — something that does not occur in breast nursing. Therefore, the mortality of artificially nursed children is six or seven times as great as that of children nursed by their mothers. Now it is becoming apparent that the ability of women to nurse their children is decreasing, — in the Stuttgart Lying-In Hospital only one fourth were thus able to nurse their children. Dr. Binders has shown that artificial nursing was unknown in the fifteenth century. Therefore the cause is to be sought near at hand. Professor Bunge has sent out inquiries on the subject to several hundred physicians. From his answers he found that 72 women were able to nurse the nine months, while 215 were unable. He then inquired as to the mothers, and found that the mothers of the seventy-two could all nurse their children, but of the 215 only 29 had nursing mothers. He therefore concluded that the ability or inability is inherited. He also presented statistics to show that the ability to nurse was closely connected with soundness of teeth. Further, he found that of the women that could nurse their children, 68 per cent were abstainers, and 32 per cent moderate drinkers of alcoholics, but no regular drunkards; while of the other class, 35 per cent were abstainers, 58 per cent moderate drinkers, 6 per cent hard drinkers. Further statistics as to the fathers and mothers of these women were given by the speaker to show why he believed that the use of alcohol injures the ability to nurse, and is the cause of the present degeneration.

TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

RADIOTHERAPY.

LEOPOLD FREUND, Vienna (*Weiner Med. Presse*, No. 31, 1899), in an article to appear in the third edition of Anton Burn's *Therapeut. Lexicon*, discusses the therapeutic use of heat, light, the Roentgen rays, and electrical currents. These physical forces are closely related, and there is much analogy in the successful results obtained by their use. D'Arsonval's treatment is by electric currents of very high tension, and alternating from 200,000 to 1,000,000 times a second. The current employed, though it will light an incandescent lamp, is quite harmless to the human body; applied to the skin or mucous membrane it induces an anesthesia of from two to fifteen minutes; it is found to have a beneficial effect on certain skin diseases. It has a marked influence on metabolism and cell life; under its influence the quantity of oxygen absorbed, that of the CO_2 expired, and the amount of heat given off by the body, is increased, and there is considerable loss of body weight. On the vasomotor nerves it causes dilatation and subsequent energetic contraction of the blood vessels, and diminution followed by increase in the blood pressure; the current has, moreover, an unmistakable and intensely deleterious effect upon micro-organisms and their toxins. Its direct use, by connecting the patient with the small solenoid, is indicated for anesthesia in slight operations, for superficial neuralgia, for eczema, impetigo, psoriasis, lupus vulgaris, acne, superficial ulcers of all sorts, and in particular for itching pruriginous affections; for tropic skin affections of nervous origin, and for blennorrheal catarrh of the neck of the womb; for those diseases also which, according to Bouchard, arise from delayed metabolism (diabetes mellitus, gout, rheumatism, obesity, etc.), as well as for many functional neuroses. The current may be used indirectly either by autoconduction, the patient being placed in a large solenoid but not in contact with the circulating electricity, or by condensation, the patient forming one armature of a condenser, upon a couch made of badly conducting material, the under side of which is covered with tin plate (the second armature), with daily sittings of three to ten minutes, or less if they cause dyspnea or fatigue.

This treatment is followed by a return of sleep, increase of strength and vital energy, improved appetite, regular menstruation, decrease of uric acid, and increase of the urea discharge. The Roentgen rays, a mask of pasteboard covered with thin (0.5 mm.) sheet lead, is fitted to the body, and has apertures corresponding to the parts of the skin to be treated. Powerful inductors, great intensity of the primary and high tension of the secondary current, proper for illuminating purposes, are unsuitable in the therapeutic use of the rays. The vacuum tube is placed at 15 c. m. from the skin, so that the anticathode is opposite and parallel to the field of treatment. Daily sittings are given at first, of five, afterward of from ten to twenty, minutes; the distance of the tube may gradually be somewhat diminished. It is well to pause for two or three weeks after the first two sittings to avoid any excessive reaction due to idiosyncrasy. The effect of the rays on the skin is shown in relaxation of the deep vessels of the corium, with slight exudation in the epidermis and cutis, with consequent swelling of the hair papillæ and loosening of the hair. The molecular constitution of the cellular elements of affected parts is altered and resorption promoted.

It is not yet decided whether the deleterious effect of the rays on micro-organisms in parasitic skin affections is direct or due to increased phagocytosis. The treatment is indicated in abnormal hairiness, and in all such skin diseases as are dependent on or protracted by the presence of hair, sycosis, favus, wounds in hairy parts, trichorrhexis nodosa, furunculosis, acne, and lupus vulgaris or erythematodes, chronic eczema, elephantiasis. The exposure of any part to the rays must be at once interrupted as soon as the skin becomes turgescent or bluish red or brown: for example, in sycosis and favus, after seven to thirteen sittings, conjunctivitis may be prevented by the use of the mask and by closing the eyes, or relieved by the usual astringents; itching and erythema by borax and lanolin (fifteen per cent). In lupus the treat

ment may be more severe, and slight dermatitis does not matter. Cicatrization is progressive, and closely resembles normal skin. To cure hypertrichosis permanently, the treatment (three to five short successive sittings) must be repeated at intervals of four to eight weeks.— *British Medical Journal, Aug. 26, 1899.*

Hydrotherapeutics in Neurasthenic Cases.— In neurasthenia, when there is exaggerated irritability, hydrotherapeutic measures must be adopted so as to exercise a calming influence. Dr. H. Determann (*Zeitschrift für diatet. und physik. Therapie*, 1899, Bd. LII, Hft. 4) thinks that when the irritability is at its greatest, only lukewarm baths of 32° to 35° C. (about 90° to 95° F.) are to be used, but that later on, a gradual transition to colder applications will help to increase the power of resistance, dull the pathological sensitiveness, and probably modify the basis of the disease by promoting the circulation, sanguinification, and the metabolism of the body. Sometimes water, with six or eight per cent common salt or equal portions of brandy and water, may be employed for rapid local washing of the body before the patient gets up in the morning. Each part of the body thus treated must be rubbed dry at once, and covered up again. Occasionally the skin is so sensitive that one has to be contented with merely drying it, and often the drying may be altogether omitted. There is a large class of neurasthenic patients with general debility who easily become tired and exhausted from any sort of active occupation. The weakness may show itself in various ways; the patient's muscular power or his mental power may be chiefly affected; sometimes it is the capacity for quiet work, sometimes for quick dealings, and sometimes for social duties, which is especially diminished; but in other cases the debility may involve all the functions. In such cases the vitality of the different organs of the body must be improved by increasing both the supply and removal of the blood. The hydrotherapeutic processes must be of short duration, in order to avoid tiring the patients — rapid forms of cold water treatment according to the individual power of reaction. Warmth may be employed before the cold in order to produce a preliminary dilatation of the cutaneous vessels. In occasional cases, when the patient can not take sufficient exercise after the cold application, and when in spite of the ordinary rubbing, etc., the reaction remains insufficient, the shock of a very short, hot bath (36° to 42° C.) of four to twelve seconds may be employed if there be no special contraindication.

When selecting hydrotherapeutic methods for neurasthenia, the medical man must always consider what the disturbance in function is which he wishes to remedy, and the means he decides upon should be prescribed (best written out on paper) with the greatest exactitude. No unnecessarily violent or cold measures should be used, and in severe forms of neurasthenia especial care is required. Generally only one or two applications should be prescribed for a single day. The methods employed must be changed according to indications. As a preliminary to any cold application the patient must be warm, and a proper reaction must be obtained afterward. Generally the head and eye must be cooled to prevent congestion. In chronic cases of neurasthenia the course of hydrotherapy should not last less than six or eight weeks, and the treatment, Determann thinks, should be afterward continued at home in a modified form. Contraindications, such as very old age, arteriosclerosis, organic diseases, tendency to apoplexy, etc., must always be considered. — *British Med. Jour., Oct. 7, 1899.*

Treatment of Pernicious Anemia. — E. Grawitz (*Veröffentlichen der Hufelandischen Gesellschaft*, Berlin, 1899), in a very valuable paper on this subject, in which he discusses what is meant by progressive pernicious anemia and draws attention to the variable factors in the causation of this important disease, gives the following as the chief etiological factors: Chronic disorders of the alimentary canal and digestive system; the influence of pregnancy, chronic hemorrhages, syphilis (this may produce chronic changes in the bone marrow, and the changes produced by other bone diseases, such as chronic osteomyelitis and sarcoma, may likewise lead to a condition of progressive anemia); various unfavorable factors in the patient's ordinary life (bad diet, stuffy rooms, overfatigue, mental troubles,

shock, etc.); chronic poisoning (chronic effects of small quantities of carbon monoxide in the air); the effects of intestinal parasites (bothriocephalus and anchylostomum) which may persist after the removal of the parasites themselves. The author does not believe that microbes are found in the blood as the result of this condition. He thinks the prognosis is especially grave in pernicious anemia which has developed in old syphilitic cases. In the treatment of this disorder the etiological facts in each case must be considered. When patients are apparently improved, the danger of a relapse must always be borne in mind.

Such patients are no more to be regarded as cured than are diabetic patients when by careful dieting their urine becomes free from sugar. In the majority of cases, rest in bed is the first and most important requisite at the beginning of the treatment; all digestive disorders must be corrected, and in cases in which there is intestinal putrefaction the alimentary canal must be made aseptic. The results of all this treatment must be estimated by regular examination of the body weight. Before beginning the use of medicine the author states that the general nutrition and digestion should be cared for. Treatment in suitable medical institutions is as much required as it is for diabetes, obesity, and other chronic disorders. While the author suggests the use of arsenic and quinine for the treatment of this disorder, he relies principally on bringing about a normal state of the nutritive functions of the body by establishing a proper dietary and proper hygienic surroundings for his patients. When improvement is established, careful massage and exercises can be employed and a heavier diet given.—*British Medical Journal, Dec. 30, 1899.*

The Treatment of Paroxysmal Uric Acid Headache.—Haig (*Br. Med. Jour.*, Nov. 4, 1899), in a paper entitled "The Treatment of Headaches," gives the following suggestions with reference to the treatment of paroxysmal uric acid headache:—

"1. Avoiding foods or drinks which contain uric acid or xanthin.

"2. Not taking more nitrogenous food than physiology requires.

"3. Clearing out stores of uric acid already in the body from neglect of 1 and 2.

"1 demands the avoidance of all animal foods except milk and cheese, and of certain vegetable substances rich in alkaloids, as tea, coffee, etc.

"2 means taking enough albumin to produce from 3 to 3.5 grains of urea for each pound of body weight per day, but not more.

"3 is generally sufficiently provided for by the change of diet, but occasionally it is necessary to give a course of salicylates to aid elimination.

"Any one thus completely altering his diet may expect a diminution both of the frequency and the severity of the headaches in a few weeks, and that they will be reduced to one tenth or one twelfth of former numbers in twelve to eighteen months, which, with a correspondingly large decrease in severity, amounts practically to cure; but let him take again uric acid in any form, and they will quickly return.

"With improvement in the headache will go improvement in the blood decimal or 'worth' quickening of capillary circulation, and fall of blood pressure throughout the body; and any accurate measurement of the condition of the blood and its circulation is a perfectly reliable index of the effects of the treatment."

Treatment of Female Diseases with Cold Baths.—T. Engleman (*Brit. Gyn. Jour.*, V., 1899; *Blätter klin. Hydro.*, October, 1899) says that simple baths at ordinary bodily temperature produce several effects, such as a feeling of good health and quiet, a certain pleasing sense of restfulness of varying duration, increase of appetite, more restful and profound sleep, deeper respiration; the excretions of the skin and the processes of oxidation are increased, and therewith also the loss of carbonic acid; consequently the whole metabolism is increased. Contractions of the uterus and other viscera are also excited by the stimulation of the skin. The baths therefore exert such an influence upon the human body that the products of disease disappear in great measure Further, they influence in a mild manner the whole surface of the skin, and may easily be repeated and regulated according to the individual conditions. If we admit that cold baths more or less stimulate the resorption, we can also presume that they are in-

dicated in the greater part of those female diseases which depend upon an increase in the volume of the organs or on residues of inflamed products. This form of treatment gives the most satisfactory results when it can be employed in the early stages of the disease, at which time the pathological products are most readily absorbed. The peri- and parametritis are the best diseases for treatment by means of hydriatic procedures, and we see good results in such cases even where all other measures fail. Further, the metritis, endometritis, chronic salpingitis, and oöphoritis are successfully influenced, since the bath removes the congestion. The baths are to be also recommended in fibroma and fibromyomata. As the volume decreases, the hemorrhage ceases. These are no less advantageous in a series of other disease processes, especially in leucorrhea and disturbances of menstruation. Acute inflammations may be regarded as a contraindication.

The Etiology of Scarlet Fever.—H. O. Hall (New York *Med. Rec.*, Nov. 11, 1899), in the course of twenty-five years' service in the library of the surgeon-general's office, in connection with the compilation of the "Index Catalogue," was led to make a somewhat extensive research into the literature of the subject of "Milk as a Cause of Disease," which revealed the following facts: —

1. That, while scarlet fever occurs in epidemic form in all countries, especially among children, it does not occur in countries where cow's milk is not used as a food, or where children are raised on mother's milk only.

2. That in Japan and China, where cow's milk is not used as a food, scarlet fever is unknown, or very rare.

3. That in India, where cow's milk is used as a food, but where, as in Japan, children are nursed until three, four, or even six years old, scarlet fever is rare, if not unknown.

4. That in countries where goat's milk and ass's milk are used as food, scarlet fever is unknown.

5. That epidemics of scarlet fever in London and elsewhere have been traced directly to the use of milk from certain cows affected with the teat and udder disease, and that milk has not been infected by coming in contact with the disease in man.

6. That certain diseases in the lower animals are co-existent with or precede or follow similar epidemics in the human race.— *Medical Review, Dec. 2, 1899.*

Chronic Malarial Nephritis.— Chas. W. Lamed, M. D. (*Johns Hopkins Bulletin*, July, 1899), reports an illustrative case, and arrives at the following conclusions from it and other cases recorded by Thayer, Kelsch, and Kiéner: —

1. Certainly in some localities malarial fever should be given a prominent position in the etiology of chronic as well as of acute nephritis.

2. In all cases of malarial fever the urine should be closely watched.

3. A blood examination should be made in all cases of nephritis occurring in those who have visited or lived in a malarial district, as it often happens that the severe grade of nephritis resulting may mask entirely the clinical picture of malarial fever.

Varieties of Tabes Dorsalis.—Adamkiewicz (*Berl. Klin. Woch.*, June 5, 1899) makes the following classifications of the different varieties of tabes dorsalis:—

1. The usual and most common form of tabes is that attended with parenchymatous degeneration of the posterior columns, with ataxia of progressive character, and grossly preserved muscular vigor. Its origin is unknown, and it is incurable.

2. Traumatic tabes, which agrees with the preceding in its anatomic basis and its incurability, but is distinguished by its genesis, which is always traumatic, and by its stability, as compared with the progressive character of the former.

3. Syphilitic tabes, which originates in the vessels of the posterior columns, these being especially predisposed to syphilitic changes by reason of their peculiar arrangement. This variety occurs in two forms: (*a*) As acute syphilitic tabes, it depends on endarteritic processes, and like these is curable. (*b*) Chronic syphilitic tabes, on the other hand, depends on interstitial changes in the posterior columns, and is thus stationary and incurable. Both forms of syphilitic tabes are characterized by motor weakness, ataxia, —slight, in the acute form—or entirely wanting in the chronic form — and ab-

sence of sensory disturbances. The knee-jerks are wanting in all forms of tabes, but in the acute syphilitic variety they may be variable.—*Journal of the Am. Med. Asso., Aug. 12, 1899.*

Relative Frequency of Varicocele on the Right and Left Side.— Vedora (*Il Policlinico*, March 15, 1899) has carefully examined this question from the anatomical point of view, and finds that the left internal spermatic vein is congenitally devoid of valves that are functionally efficient, with a frequency twenty-six per cent times greater than the right spermatic. When the left pampiniform plexus is affected with primary varicocele, the corresponding spermatic vein is usually devoid of valves. The author therefore concludes that one of the predisposing factors in the development of varicocele consists in the absence of efficient valves in the lumen of the spermatic veins. The minor frequency of right varicocele is due to the almost constant presence of efficient valves at the point where the right spermatic vein debouches into the inferior cava.—*British Medical Journal, Sept. 16, 1899.*

Oatmeal a Cause of Constipation.— Geo. J. Munroe, M. D. (*Lancet Clinic*), is of the opinion that while oatmeal can be used freely by outdoor laborers, it should be used sparingly by those of sedentary habits. In his own case the author found that when he ate oatmeal three times a day, that before the end of the first week he was constipated; and before the end of two weeks he had to take cathartics and an enema to evacuate the bowels. The condition was relieved in the course of three or four weeks by discontinuing the oatmeal and substituting fruits and vegetables.

The Biter Bit.— The following amusing tale was recently told to his class by Professor Comstock, of Cornell, in speaking of the trials of scientists. It appears that a professor of invertebrate zoölogy in a sister university wished to procure some trichinous pork for purposes of experiment. The learned scientist went to the butcher and asked him if he ever got any measly pork. "Sometimes," the butcher cautiously answered, "but I always throw it away." "Well," said the professor, "the next time you have any, I wish you would send me up some," meaning, of course, to his laboratory. The butcher, although somewhat taken aback, said that he would. Three weeks passed, when the professor, growing impatient, again visited the market. "Haven't you found any measly pork yet?" "Why, yes," said the butcher, "I sent up two pounds a week ago." A sickly grin broke over the professor's face. "Where did you send it?" "Why, to your house, of course," said the butcher.—*Medical Record, Nov. 4, 1899.*

A School for Tubercular Children. — An institution known as the Sanitarium d' Hendaye has been established near Paris, the purpose of which is to provide a school for tubercular, feeble, and other children who are incapacitated from attending public schools by reason of failing health. The institution fills a twofold purpose, in that it cares for the health of the children, and at the same time gives them such an education as their health will permit.

Diagnosis of Cancer of the Stomach.— Guinard has shown that it is highly advantageous to inflate the stomach with air in an examination with reference to the location of a morbid growth, the presence of which may be suspected. If the tumor is present in the anterior wall, it will still be apparent after the stomach is dilated; but if the growth is in the posterior wall, the dilatation of the stomach will cause its temporary disappearance.

Delirium Tremens Treated by Means of the Cold Bath.— Letule (*Presse Médicale*, June, 1899) claims that cold baths at 65° F. are efficient in the treatment of delirium tremens. The patient is placed in a full bath at this temperature for ten to fifteen minutes. This is repeated every two or three hours as long as the condition of the patient seems to indicate.

DRS. WILLIAM OSLER and Howard Kelly, of Johns Hopkins Medical School, Baltimore, have been elected honorary members of the Royal Academy of Medicine of Ireland.

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

Ocean Bacteria.— Professor Fischer (Kiel) and Dr. Bassengo have investigated at different times a section of the Atlantic stretching from 60° north latitude to 8° south latitude; and Professor Fischer has published some of their results (*Deut. Med. Woch.*, Sept. 14, 1899). Near land, as might be expected, the number of bacteria was greatest, and diminished rapidly farther out at sea. On the edge of an ocean current, and especially where a current came up from below, they were more numerous again. The idea suggested by this observation — that they might be more numerous in the depths than on the surface — was confirmed by actual experiment. Bacteria were found down to a depth of 1,100 meters (about 596 fathoms); at a depth of from 200 to 400 meters (about 100 to 200 fathoms) they were regularly found in considerably larger numbers than at the surface. This comparative paucity at the surface is attributable to the germicidal effects of sunlight. On the whole, the number of different sorts found was small; some kinds, however, were very widely spread. The micro-organisms found consisted chiefly of bacteria. Hyphomycetes were found only near land. Blastomycetes occurred so abundantly and at such distances from land that it is certain they develop in the sea. Typical cocci and bacilli were practically never met with on the high sea. The ocean bacteria were remarkable for great variations in size and shape. Twisted forms were very frequently seen which at first sight resembled comma bacilli. At other times spheres and rods — long, short, or even threadlike — were seen. Zoöglea masses were frequently found, and still more commonly the so-called involution forms. In none of these species was spore formation observed, though some of them were cultivated for two years and a half. All the sea bacteria were capable, in certain stages of development, of spontaneous movement. In some this was affected by a bunch of flagella at one end; they did not stain by Gram's method. Some were facultative anaerobes, and some developed various colors during cultivation. Among the luminous bacteria were some which would grow at a temperature of 0° C. It is probable that the sea bacteria play a part in the way of decomposing dead organic matter, etc., similar to that of the land bacteria.— *British Medical Journal, Sept. 30, 1899.*

Two New Stains for the Gonococcus.— R. G. Schuec (*Bull. Clevelana Gen. Hosp.*, April, 1899) describes Rick's solution as follows: —

Ziehl's carbol fuchsin	15 drops.
Concentrated alcoholic solution of methyl-blue	8 drops.
Distilled water	20 c.c.

Stain cold for ten seconds, wash with water, dry, and mount. The gonococcus will be stained a deep blue, other bacteria a light blue, cell-nuclei a still lighter blue, protoplasm pink. The second stain is recommended by Lanz, and should be freshly prepared, though they have employed them for six weeks. Formula: Saturated solution of fuchsin in two per cent carbolic (aqueous), 10 c.c.; saturated solution of thionin in two per cent carbolic (aqueous), 40 c.c. Stain without warming, for one-fourth to one-half minute, and wash with water. The gonococci are stained by thionin, the cell-protoplasm by the fuchsin, and the nuclei by both colors at the same time. If these solutions are allowed to act too long, the desired effect is not obtained.— *Phila. Med. Jour., Aug. 19, 1899.*

Constant Presence of Long Streptococci on Healthy Tonsils.— P. Hilbert (*Zeitschrift f. Hygiene u. Inf.*, XXXI, 3) states that streptococci which frequently prove to be virulent, were constantly found on the healthy tonsils of fifty school children and fifty patients at the Polyclinic. A careful comparison made between streptococci obtained from ten healthy tonsils and ten with tonsillitis failed to show any difference between them in respect to their behavior in cultures or virulence. The author concludes from these facts that it is in the highest degree improbable that the streptococcus has any etiological significance whatever in respect to infectious affections of the tonsils.— *Journal American Medical Association, Nov. 25, 1899.*

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PROFESSOR ATWATER'S EXPERIMENTS.

IT is interesting to note how general and unanimous has been the protest against the statements published by Professor Atwater recommending alcohol as a food. Professor Atwater claims to have proved that alcohol is oxidized in the body, and that on this account it must be regarded as a food. At first this bald statement was received with respectful silence, as the details of the experiments made by the professor had not yet appeared. Science bases its conclusions upon actual facts, and scientific men could do naught else but wait until the facts and details of the experiments made, were published, so that the conclusions drawn from the experiments might be critically reviewed, and their correctness verified or disputed.

Bulletin No. 69 of the United States Department of Agriculture contains an official account of the experiments which Professor Atwater claims to be proof of the nutritive value of alcohol. Since the publication of this Bulletin, which appeared under date of Nov. 6, 1899, various men of recognized scientific standing have carefully reviewed his findings, and we feel sure that our readers will be interested in the following statements from men whose right to speak upon this subject can not be questioned: —

"Professor Atwater's own figures, as set forth in Bulletin No. 69 of the United States Department of Agriculture, do not support his claim. He states that 'whether the body [of the man experimented upon] was at rest or at work, it held its own just as well when alcohol formed a part of the diet as it did with a diet without alcohol.' His tables, on the other hand, show at once that, when alcohol is substituted in part for carbonaceous foods, there is an increased loss of body-nitrogen. We can not therefore understand or accept his statement that alcohol protected the material of the body just as effectively as the corresponding amounts of sugar, starch, and fat." — *Professor Seneca Egbert, of the Medico-Chirurgical College of Philadelphia, and Professor Frank Woodbury, of the Philadelphia Polyclinic and College for Graduates.*

"The third conclusion, that 'the alcohol protected the material of the body from consumption just as much as the corresponding amounts of sugar, starch, and fat,' is far from being a justifiable conclusion from data given in Bulletin No. 69. The experiments there given, in which alcohol was used, show an actual loss of nitrogen, showing a consumption of body-proteid during the period. Professor Atwater can draw but one tenable conclusion from Bulletin No. 69; namely, alcohol is oxidized in the system, but is not food." — *Winfield S. Hall, Ph. D., Professor of Physiology, Northwestern University Medical School, Chicago.*

"One fails to find any support for the view that alcohol, like corresponding amounts of sugar, starch, and fat, protects the body against proteid waste, in Dr. Atwater's own figures. Thus in experiment 7, where 417 grams of proteid were given in four days, there was a loss of nitrogen equivalent to 48.2 grams of proteid. In the other alcohol experiment (number 10), there is a similar though somewhat smaller loss of nitrogen. One is therefore compelled to admit that these experimental data do not support this third conclusion of Dr. Atwater.

"Indeed, if persons on a diet adapted to keep them in nitrogenous equilibrium regularly showed such losses of nitrogen while using alcohol as are shown in Dr. Atwater's tables, we should have very satisfactory evidence that the alcohol was acting as a poison to the cells of the body; that is, as a protoplasmic poison.

"The two Atwater experiments with alcohol (in Bulletin No. 69) were carried on for so short a period that they throw no light whatever on the food value of alcohol when used continuously. Even if these experiments demonstrated that alcohol can replace a portion of ordinary non-nitrogenous food during four days in a healthy man, this fact would afford no scientific basis for the view that such a replacement can be indefinitely carried on without detriment to the organism. It is difficult to believe that an investigator occupying an important government position should be so unintelligent as to give utterance to views favorable to the use of alcoholic drinks on the strength of experiments of such limited scope as those published in Bulletin 69." — *C. A. Herter, M. D., Professor of Pathological Chemistry, University and Bellevue Hospital Medical School, New York.*

Professor Atwater has taken upon himself a heavy task,— to establish the food value of a substance which, for a generation at least, has been recognized by all scientific authorities as a poison. Alcohol is named as a poison in all the leading medical dictionaries (Quain, Gould, Dunglison, etc.). In the classical works on toxicology and medical jurisprudence, alcohol has never been recognized as a food, and has never been called a food except by those who have desired to bolster up its habitual use.

Dr. Adolph Fick, Professor of Physiology in the University of Würtzburg, a man of world-wide fame as an experimental physiologist, and who has made a special study of the subject of foods, after defining poisons, remarks: —

"That alcohol is such a substance can not be doubted. . . . Very appropriately has the English language named the disturbance caused by alcoholic beverages *intoxication*, which by derivation means 'poisoning.'"

Professor Koppe, M. D., an eminent German authority, referring to the pretended food value of alcohol, in an address before the International Medical Congress in Moscow in 1897 remarked as follows : —

"The opinion that ethyl alcohol is a useful source of heat energy in the human organism in consequence of its combustibility, is not scientifically justified.

"The consideration alone that a substance is oxidized in the body in no wise justifies its use as an energy-furnishing food. Morphine, as is well known, burns in our bodies into oxydimorphine. Happily, however, it has not occurred to anyone to proclaim morphine for this reason a proper source of energy (a food) for the human organism, as is unfortunately done in the case of ethyl alcohol."

Dr. Bienfait, of Liege, speaks very forcibly and radically upon this question as follows : —

"In order to be a food, it is not sufficient that a substance be decomposed or oxidized in the tissues. Under these conditions many harmful substances would be considered foods. Ether is decomposed in part; chloroform is partially destroyed. But do we consider these substances foods? — Certainly not. Other things than decomposition are necessary to nutrition. It is necessary that the decomposition be made in a way that will not injure the vitality of the cells. A part of the alcohol that is destroyed in the body undergoes this decomposition in a way that is injurious. Observe that whereas true foods, such as sugar and fat, are destroyed slowly, easily, without provoking too lively a

combustion, alcohol is burned too rapidly, provoking a veritable explosion. Suppose that a locomotive has to run a certain number of kilometers; in order to do this, it must be given fuel. This is the coal, which it burns slowly and methodically. If in the place of coal we throw naphtha on the fire, the combustion of this may furnish as much heat as the coal, but it is burned instantaneously, in the form of an explosion. The heat thus produced is not utilized in the machine. What naphtha is for the locomotive, alcohol is to our bodies; it is an explosive, but not a food."

The *Deutschen Medicinischen Wochenschrift*, one of the most authoritative medical periodicals, published editorially the following statement in its issue of Dec. 8, 1898:—

"The views concerning the action of alcohol upon human metabolism have essentially changed within a short time. In the year 1888, at the Congress for Internal Medicine, Binz, as the first reporter on the subject of alcohol, said that in the whole question only one fact remained without contradiction; namely, that alcohol by its oxidation spares albumin. But precisely this view is contraindicated by more recent experiments. These experiments have shown that alcohol does not spare albumin. Therefore it is reasonable to bring together with this deviating conduct of alcohol, opposite to the effect of carbohydrates and fat, a poisonous action of the same upon the albumin of the cells."

A large number of additional statements from eminent scientific men might be presented in contradiction of the hasty assertions of Professor Atwater, which, as shown by Drs. Woodbury, Hall, and others, are actually disproved by his own experiments. It is interesting to note that Professor Atwater's associate in the experiments referred to, Prof. H. W. Conn, at a very early date in the discussion took care to place himself before the public in an attitude by no means supporting the position of Professor Atwater. This will be clearly evident from a perusal of the following paragraphs for which he is responsible:—

"Alcohol is not used as a food. It is used always for its influence upon the nervous system, and one of the well-known results is that, at least among Americans, the use of alcohol in small amounts is almost sure to pass speedily into its use in larger quantities."

"To state that alcohol in any quantity is safe is a woeful misinterpretation. No one can yet state at what point the secondary injurious effects begin, and no one can state what is a small and what is a large dose."

"A physicist could experiment with gunpowder, and prove that it is easily oxidized and gives rise to a large amount of heat and energy. From this it might be argued that gunpowder is a most useful kind of fuel for cook stoves. Such a conclusion would be hardly less logical than the conclusions that have been drawn from these experiments with alcohol, and which regard it as a useful food for the body. Gunpowder is a very unsafe fuel because of its secondary effects, and in the same way the food value of alcohol can not be determined by its power of being oxidized, but must include the consideration of its secondary effects as well."

We are indebted for the above extracts to a summary of scientific facts and statements from various authorities, and published by various committees interested in the suppression of alcoholic intemperance, under the title, "An Appeal to Truth." New York, 3 and 5 West 18th Street.—*J. H. K., in Bulletin of the American Medical Temperance Association.*

REVIEWS.

THE EMPIRE OF THE SOUTH.— What is unquestionably the most comprehensive and beautiful volume ever issued upon the South, has just been published by the Southern Railway. Its title, "The Empire of the South," conveys an impression of its general character, but nothing short of a thorough reading demonstrates how carefully the author, Mr. Frank Presbrey, has gone into every interest of this section,— commercial, industrial, and educational. The book is a superbly illustrated octavo volume of nearly two hundred pages, and not only is the South and all of her vast interests treated in a general way, but each State is separately given full representation. The author had the co-operation of the officials of the Southern Railway in its preparation, and evidently the greatest pains have been taken to make a presentation which is thorough, correct, and at the same time exceedingly interesting. We quote the opening chapter, which appears in the volume under the heading, "The South — Yesterday, To-Day, and To-Morrow: " —

"The advance of the Empire of the South has been one of the grandest and most noteworthy movements in the industrial and commercial history of the world. It has annulled the force of the adage, 'Westward the course of empire takes its way,' and has destroyed for all time the theory of political economists that emigration follows isothermal lines.

"Considered in general, the development of the South in all avenues of human activity has been coincident and parallel to the growth of the country at large. When, however, this great region is considered by itself, or in connection with individual sections of the United States, a basis of comparison is presented which brings out with startling clearness and in incontrovertible figures the majesty and rapidity of its unparalleled progress.

"Taken as a whole, the States included in this area form on empire of a half a million square miles. It is four times greater than England, Ireland, and Scotland, and more than seven times larger than the combined area of the New England States. Within its borders could be placed sixty-four States the size of Massachusetts, and five hundred the size of Rhode Island. It has so generous a supply of natural and material wealth, that, if the balance of the world should be swept out of existence, it could prosper and support itself through the ages to come. Raw materials exist or are successfully grown in every part of the South in such prodigal abundance that transportation from mine and field to factory is a minor item. It has a system of intercommunication and connection with the outside world by water and rail which limits the boundaries of its trade and commerce only as civilization is limited. It has a genial climate and a prolific soil, and in all avenues — industrial, commercial, agricultural, and intellectual — offers its own citizens, and those who may in the future become such, every advantage and inducement to be found in any portion of the United States."

Copies of "The Empire of the South," a volume of 184 quarto pages and 500 illustrations, may be had by remitting 15 cents to cover postage to J. C. Beam, Jr., Northwestern Passenger Agent, 80 Adams St., Chicago, Ill.

PAMPHLETS RECEIVED.—"Etiology and Treatment of the Diseases of the Lachrymal Apparatus." Albert E. Bulson, M. D., Jackson, Mich.

"The Eyes and Ears of Employees of Transportation Companies." Frank Allport, M. D., Chicago.

"The Climate of Colorado for Respiratory Diseases;" "The Tuberculosis Crusade and Its Problems." Chas. Denison, A. M., M. D., Denver, Colo.

"Observations and Reflections on Abdominal Surgery." Prof. A .C. Bernays, St. Louis, Mo.

PUBLISHERS' DEPARTMENT.

CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS.

THE fifth annual meeting of the Congress of American Physicians and Surgeons will be held in Washington, D. C., May 1, 2, and 3, 1900. Chairman of the executive committee, Landon Carter Gray, M. D., New York City; treasurer, Newton M. Shaffer, M. D., New York City; Secretary, William H. Carmalt, M. D., New Haven, Conn.

The meetings of the Congress will be held in the Lafayette Square Opera House. Tuesday, May 1, at 2:45, P. M., the Congress will be opened by the chairman of the executive committee. From 3 to 5 P. M. the subject of the general session of the Congress will be "Bacteriology in Health and Disease." Papers will be read as follows: —

"Adaptation of Pathogenic Bacteria to Different Species of Animals," by Prof. Theobald Smith, Boston, Mass.; "The Physiological Resources of the Body in Its Defense against Bacteria and Their

The Battle Creek Sanitarium
LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, M. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR JANUARY.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
103 per cent	7		7
100 " "	70	31	101
97 " "		1	1
95 " "	12	15	27
93 " "	16	12	28
91 " "	1	1	2
88 " "	3	1	4
85 " "	3	1	4
78 " "	1		1
71 " "		1	1
67 " "		2	2
64 " "	4		4
Total	117	65	182

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	47	11	58
Between 4,500,000 and 5,000,000	36	24	60
" 4,000,000 " 4,500,000	20	16	36
" 3,500,000 " 4,000,000	6	8	14
" 3,000,000 " 3,500,000	2	3	5
" 2,500,000 " 3,000,000	3		3
" 2,000,000 " 2,500,000		2	2
Below 2,000,000	3	1	4
Total	117	65	182

Examination of Sputum.— There were 28 examinations made, 21 being new cases. Tubercle bacilli were found in 7 cases.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	42	76	10	67	24	55	76	67
Less than 10,000 bac	11	20	3	20	4	9	18	16
Between 10,000 and 100,000 bac	2	4	2	13	12	27	16	14
More than 100,000 bac.					4	9	4	3
Total	55	100	15	100	44	100	114	100

The patients were received from the following States and countries: Michigan, 35; Illinois, 20; Indiana, 8; Iowa, 7; Ohio, 6; Wisconsin, 4; New York, 4; Canada, 3; Manitoba, 3; Tennessee, 3; Montana, 3; Minnesota, 2; Texas, 2; South Dakota, 2; Missouri, 1; Kansas, 1; Mississippi, 1; Pennsylvania, 1; Kentucky, 1; Ontario, 1; Virginia, 1; Armenia, 1; unclassified, 4. Total, 114.

Urinary Laboratory.— Total number of specimens examined, 498; number of new cases, 232; number of cases having albumin, 13; sugar, 5; casts, 14; blood, 3; pus, 135; bile, 1.

Toxic Products," by Samuel J. Meltzer, M. D., New York City; "Flagella and Serum Reactions," by Prof. Harold C. Ernst, Boston, Mass.; "Relation of Bacteriology to Clinical Medicine," by Richard C. Cabot, M. D., Boston; "Bacterio-Therapeutics with Especial Reference to Tuberculosis," by Edward R. Baldwin, M. D., Saranac, New York; "The Etiology of Malarial Fevers," by Prof. William S. Thayer, Baltimore, Md.; "Infection by Animal Parasites," by Prof. George Dock, Ann Arbor, Mich.; "Bacteriology of Dysentery," by Prof. Simon Flexner, Philadelphia, Pa.

At the general session on Wednesday, May 2, from 3 to 5 P. M., Prof. William Osler, M. D., LL. D., of Baltimore, will read a paper on "Modern Therapeutics;" Clarence J. Blake, M. D., of Boston, a paper on the "Sociological Status of the Physician;" S. Weir Mitchell, M. D., LL. D., of Philadelphia, a poem on "The Evolution of the Physician."

At 8 P. M. the president of the Congress, Prof. Henry P. Bowditch, M. D., LL. D., D. Sc., Professor of Physiology in the Harvard Medical School, will deliver an address on "The Medical School of the Future." Following this there will be a reception.

On Thursday, May 3, at 8 P. M., a banquet will be given for the members of the Congress.

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GOOD HEALTH, Battle Creek, Mich.

MODERN MEDICINE

VOL. IX. BATTLE CREEK, MICH., U. S. A., MARCH, 1900. NO. 3.

ORIGINAL ARTICLES.

THE RATIONAL TREATMENT OF INSOMNIA.

BY J. H. KELLOGG, M. D.,
Superintendent of the Battle Creek (Mich.) Sanitarium.
(Concluded.)

THE most important general hydriatic means for the relief of insomnia is the neutral immersion bath at bedtime. The temperature should be 92° to 95°, and the duration may be from half an hour to an hour and a half, or even longer. In obstinate cases it is not unwise to allow the patient to fall asleep in the tub, which he will often be inclined to do, care being taken to see that the head is not submerged. By letting a little hot water into the tub occasionally, so that the temperature will be maintained at the proper point, the patient may be allowed to sleep in the bath for two or three hours, or even longer, with no disadvantage whatever. The water should not be allowed to cool off, as rheumatic pains may thereby be induced.

The neutral douche for one to five minutes (95° to 92°), pressure fifteen to twenty pounds, is as effective as the neutral bath of four or five times as great duration, as it is more effective in producing circulatory reaction and thus relieving cerebral congestion.

The hot leg bath (110° to 115°), with a neutral pour to the spine (94° to 96°) for ten to fifteen minutes, and the cool compress to the head, may with advantage be applied just before retiring in cases in which cerebral congestion is the leading cause of the sleeplessness.

The evaporating head-cap may be applied in such cases with advantage. The half bath at 95° for two minutes, the rubbing wet sheet at 60° for two minutes, following a fomentation to the spine or abdomen for five to eight minutes, the Scotch douche to the spine and legs (106° for two minutes, 60° for fifteen seconds), and the wet-sheet pack are measures the value of which has been proved by clinical experience.

The wet-sheet pack is one of the most effective means of producing a condition of the brain favorable for sleep. During the neutral stage of the pack the cutaneous reflexes are suspended almost as completely as in the neutral bath. Strong circulatory reaction is produced by the accumulation of heat, the blood is withdrawn from the brain, while the membranes are made to bulge by the accumulation of lymph, as observed by Schüller. The conditions necessary for sleep — diminished blood supply to the brain, accumulation of lymph, and suppression of reflex excitation — are thus secured in a very perfect degree. By withdrawing a portion of the wrappings when the neutral stage of the pack is reached, this period may be indefinitely extended. If the patient has fallen asleep, he need not be awakened. From personal experience the writer believes that two hours' sleep in a neutral pack or the neutral bath is as refreshing as sleep twice as long under ordinary conditions. When very much pressed with work, the writer has repeatedly obtained sufficient rest and recuperation by three or four hours spent in the neutral bath and the neutral pack immediately following to enable him to go on with his work with as much vigor and satisfaction as after an ordinary night's rest.

At the conclusion of the neutral bath the patient should be placed in bed at once. Care should be taken to avoid chilling the skin by evaporation, as this will entirely destroy the effect of the bath. On rising from the bath, the patient should be instantly wrapped in a Turkish sheet and gently patted dry, without vigorous rubbing. Everything having been previously arranged, he should be prepared for sleep as quickly as possible.

If cerebral congestion is a prominent feature, measures necessary for the relief

of this condition should be employed. Cold extremities may be warmed by the hot-water bottle, or better, by the heating compress applied to each leg separately. When the legs are habitually cold, massage, the hot leg bath followed by cold rubbings, and the cold leg pack should be daily employed. Cramps in the legs occurring during sleep may be relieved by rubbing the soles of the feet with ice, or stepping upon a cold metal surface.

When the patient can not sleep because of fidgets, apply the neutral pour (96° to 92°) to the spine for ten minutes before retiring. If there is extreme hyperesthesia of the lumbar ganglia and solar plexus, a fomentation should be applied over the abdomen just before retiring, and the heating compress should be applied to be worn during the night, either with or without the protection of a rubber cloth, as may be found best.

The condition of the sympathetic just referred to often gives rise to peculiar symptoms which the patient sometimes describes as "explosions in the head," "sudden starts," or "shocks." These are likely to occur just as the patient is falling asleep, sometimes so severe as to cause him to spring to his feet. In several cases of this sort which the writer has met, this symptom was very persistent; but in every case it yielded to the application of the measures suggested.

When sleep is prevented by excessive heart action, as in exophthalmic goiter, ice bags should be applied over the heart.

Muscular rigidity and the excessive tension which sometimes produces insomnia in cases of paralysis agitans are best relieved by the application of the strong faradic or sinusoidal current or fomentations just before retiring. The application should be sufficiently strong to produce tonic spasm of the muscles, thus interrupting the tremor. The heating compress is also serviceable when the symptom is confined to a few groups of muscles. The neutral bath is of great service in these cases (96° to 94°); duration, twenty to forty minutes.

Of non-hydriatic measures which may be used in connection with hydrotherapy in the treatment of insomnia may be mentioned especially the vibrating helmet of Gilles de la Tourette, and the employment of galvanic and static electricity. These applications are to be made at bedtime. If the vibrating helmet is not at hand, a person skilled in manual Swedish movements may apply manual vibration with advantage.

In the application of galvanic electricity for the relief of insomnia, one pole should be placed at the top of the head, with the hair moistened, the other to the epigastrium; or a broad sponge electrode to the forehead and another to the occiput; or an electrode the size of the hand may be placed at the back of the neck and another over the epigastrium. The anode, or positive pole, should always be nearest the brain. The current may pass through the head laterally, the electrodes being placed behind the ears. The giddiness produced by these applications shows the power to produce anemia of the brain. The strength of current employed should be from four to ten or even twenty milliamperes, according to the size and location of the electrodes. As strong a current as possible without producing disagreeable vertigo should be used. The application should begin with a very gentle current, two or three milliamperes, and should be gradually increased until the extreme point of tolerance is reached. The duration of the electrical application should be about ten minutes. A static breeze applied for the same length of time is also an excellent measure.

When sleep is broken by frequent urination induced by cystitis or irritation of the prostate, the measures necessary for the relief of this condition should be employed. The neutral sitz at bedtime is a most useful measure (94° to 92° for fifteen to thirty minutes). The same may be said in reference to the condition known as "night terrors," and nocturnal enuresis.

"Night numbness" is a term which has been applied to the numb sensations often experienced, especially by neurasthenic patients, after remaining some time in the horizontal position. This symptom sometimes gives rise to sleeplessness by the apprehension of cerebral hemorrhage or apoplexy which it induces. In general, the symptom is of no special moment, but it should be remembered that it is sometimes the precursor of diabetic gangrene, when this disease named is present, and is also a prodromal symptom of cerebral thrombosis. It should receive special attention in cases of arteriosclerosis. If of long standing, it is generally without consequence, though

careful inquiry should be made in every case, as sensory epilepsy occurring at night may sometimes be the origin of the symptom. The writer has traced many cases of "night numbness" to the habit of lying in such a position as to bring prolonged pressure upon the large nerve trunks of an arm or leg. This symptom soon disappears as the patient's general nerve tone improves under judicious hydriatic treatment.

It is not too much to say that all cases of insomnia not due to organic disease of the brain may be cured by rational treatment, and even the incurable cases may be greatly relieved.

AUTOINTOXICATION: WITH REPORT OF CASES.[1]

BY ALFRED B. OLSEN, M. S., M. D.,
Battle Creek (Mich.) Sanitarium.

THE physiological activities of the body may be summed up in one word—*metabolism*. The term presupposes two separate processes: first, *anabolism*, which is synthetic, integrative, constructive; and second, *catabolism*, which is the reverse of the first, being analytic, disintegrative, destructive.

Through anabolism the food substances assimilated are built up into living tissues for the purpose of growth and repair. Later, they are broken down, and waste matter formed, but the larger part of the food taken is probably directly oxidized, and reduced to carbonic acid gas and water.

All waste products are poisonous, some more so than others. No longer useful to the body, they become a serious menace to life, and the sooner they can be removed from the tissues the better. A veritable suicide constantly stares man in the face. The tendency is to fatal intoxication, and it is only the faithful work of the emunctories that prevents the catastrophe.

It is the function of the blood to gather up the toxic products as they are formed, and carry them to the excretory organs, where they are separated from the blood, and eliminated from the system. If allowed to accumulate for a short time or in smal amounts, the results are disastrous, and even fatal. The blood itself, forming the channel through which these poisons reach the various outlets, is more or less toxic. This toxicity has been demonstrated by different investigators. Bouchard estimates that one kilogram of rabbit's blood is sufficient to kill five kilograms of rabbit. But the blood is constantly purified by the eliminative organs, and life thus conserved. Stop respiration, and death from asphyxia results in a few minutes. Uremia is due to the cessation of renal activity, and is also rapidly fatal.

It would be interesting to determine the toxicity of the tissue elements, but this is scarcely possible. They are constantly bathed not only by nutrient material brought to them by the blood, but also by their own excreta. If the latter fails to be properly and quickly carried away, it accumulates, and clogs the lymph spaces, interfering with the nutrition of the cells.

The toxicity of the urine is no longer doubted. Bouchard has shown that the urine secreted by the average man in fifty-five hours contains enough poison to kill him. This is in health. In disease it becomes more toxic, sometimes less so. The same investigator describes seven toxins found in normal urine. One is urea, a diuretic, which, passing through the renal epithelium, carries with it water and other substances. Its toxicity is slight. Another is a narcotic; still another a sialogogue; while two poisons produce convulsions.

It is interesting to note in passing that the urine passed at night is only one half as toxic as that passed during the day, when activity is greatest. This is due to lessened tissue metabolism. On the other hand, the urine of the farmer who lives an energetic outdoor life is one third less poisonous than that of the sedentary townsman. Bouchard explains this apparent contradiction by observing that in the former the metabolic processes are more active, and the waste end-products more perfect and less poisonous than imperfectly oxidized substances, and this seems reasonable.

Turning to the liver, we find that its secretion is six times more toxic than urine, and the bile secreted in nine hours contains enough poison to kill a man. Its toxicity is chiefly due to the coloring

[1] Paper read before the Calhoun County Medical Association, at Albion, Mich., March 6, 1900.

matter and bile salts. The average amount of bile secreted in twenty-four hours in a man weighing from sixty to seventy kilograms is from eight hundred to one thousand cubic centimeters. About half of the total quantity is eliminated through the bowels, the remaining part being reabsorbed and carried to the liver, where it is separated from the blood, and again secreted.

Having briefly considered some of the poisonous tissue wastes of the body, let us turn to the gastrointestinal tract. The poisons of alimentary origin are both numerous and virulent. Their sources are three: (1) Through impure or poisonous food; (2) through a perversion of the digestive functions so that fermentative and putrefactive processes take place; (3) through the secretion of bile into the intestine.

It was Gaspard who first demonstrated the toxic character of putrid substances. He also showed that they are more poisonous than products of tissue waste. This was as far back as 1822. His work was accepted by Billroth, and later by Koch, who confirmed the previous observations.

That putrefactive processes are common in the intestine is a well-known fact, and this in spite of the presence of free hydrochloric acid in the gastric juice, because the mineral acid is rarely strong enough to destroy the microbes in a short time, merely inhibiting their growth. It has been thought that bile possessed antiseptic properties, but at best they are very slight, for it readily undergoes putrefaction.

According to Boix, there are two conditions which especially favor the formation of poisons in the alimentary canal; *motor insufficiency*, and *stagnation* of the *ingesta*. This means a loss of tonicity and elasticity, and clapotage is commonly present. The stomach is dilated and prolapsed, and there is general enteroptosis. Bouveret defines dilatation of the stomach as "a permanent pathological condition which at one and the same time is characterized by increase of volume, diminution of tonicity, and existence of retention." Under such conditions we would expect to find fermentation the rule rather than the exception, and such is the case. Very soon a chronic gastritis is set up, which is accompanied by excessive mucus formation. Gastric digestion is directly interfered with, and becomes perverted. The gastric glands slowly undergo a mucous transformation, and the acid secretion is diminished. Fermentations of various kinds soon prevail, and many are the products to which they give rise. These are all of a more or less poisonous character, and finding their way into the blood, they produce various intoxications.

When to the physical changes we add some of the common errors of diet, such as hasty and too frequent eating, overeating and excess of drinks, the use of stimulants, condiments, pastries, and highly seasoned food, together with an excess of flesh foods, we are not surprised at the numerous gastrointestinal disorders which are encountered. Among these, chronic constipation is one of the most common. Inactivity of the bowels is a serious condition, and prolific of many physical ailments, for it leads to the absorption of much toxic material into the blood, overworking the liver and kidneys, and clogging the system generally. Nervous troubles multiply, renal disease is begun, and congestion of the liver results.

Speaking of the liver, Blondlet makes the following significant statement: "Situated, as it were, at the principal entrance of the human economy, the gate through which must pass all the nutritious substances arriving from without through the portal vein, the liver arrests their progress in order to make them undergo a radical decomposition." The poisonous substances it quickly separates from the blood, and transforms them into less harmful substances, or retains them to be excreted through the bile, or finally through the kidneys. Hence the liver is constantly subject to a physical strain, which may at any time exhaust it, and produce the common condition of biliousness. Such a liver is overworked and clogged by an accumulation of poisons. Congestion results, which, if not relieved, soon leads to a more or less severe inflammation, and this, becoming chronic, produces a typical cirrhosis of the liver.

The following are some of the interesting experiments made by Boix on rabbits to demonstrate the deleterious effects of gastrointestinal putrefactive products upon the liver when carried there in the portal blood. The animals were all apparently

healthy, and subjected to the same conditions, except the poison fed them: —

1. A rabbit weighing 1,960 grams was given daily half a gram of butyric acid with its food. At the end of two months and twenty-eight days it died, weighing but 1,195 grams. Microscopic examination of the liver showed a typical atrophic cirrhosis.

2. A rabbit weighing 1,850 grams was given daily two grams of lactic acid with its food. In three months the animal died, weighing 1,230 grams. Again hepatic cirrhosis.

3. Acetic acid was given, the rabbit dying in thirty-six days. The liver weighed thirty-five grams, and showed marked sclerosis, together with granular degeneration.

4. The rabbit was fed half a gram of pepper daily, and died in twenty-seven days. The kidneys and liver were much congested, the liver sclerotic, and the cells in a state of granular degeneration.

Many more experiments might be cited, but the results were so similar and uniform that it would be almost repetition. It is very evident from the foregoing that hepatic cirrhosis can be produced by gastrointestinal disturbances leading to the formation and absorption of putrefactive products. At one time the idea prevailed that sclerosis of the liver was due alone to the use of spirits, or syphilis, or lead poisoning, and the idea still prevails to a large extent, hence the English name, "gin-drinker's liver." But this is not true, and Boix was the first one to demonstrate scientifically a hepatic cirrhosis due to autointoxication. To this condition he has given the name "dyspeptic cirrhosis," meaning, to quote his words, "a sclerosis of the liver which results from an autointoxication of gastrointestinal origin."

The experiments above mentioned have been fully confirmed by observations upon man. The following cases reported by Millon are especially instructive: —

CASE I.

"Louis P ——, nineteen months old, a fine-looking child, suckled until sixteen months. Since weaning, . . . the child is stuffed with soups, with starchy vegetables, mashed potatoes, carrots, etc.; he also eats enormously and gluttonously; in addition he is a great drinker. He ordinarily digests well, but has a tendency to constipation, and his passages smell horribly. His belly is large and distended. There is clapotage at the umbilicus several hours after eating; *the liver extends three and one-half centimeters below the ribs.*"

CASE II.

"Lucienne B ——, two and a half years old, eleventh child; father a neuropath and a drunkard. Brought up on the bottle. Measles, whooping-cough, bronchial catarrh, convulsions. Was early accustomed to eat every kind of food; has had diarrhea. Tendency to rickets. The belly is enormous; *the liver extends downward one and a half fingers' breadth.* The child digests well everything which is given it; she has no constipation, but the feces smell bad."

CASE III.

"Pierre S ——, ten years old, small and puny, very thin. Nourished improperly; has very little appetite, and is fed almost exclusively with black coffee and *café au lait.* Great drinker, nervous. Wakens frequently at night. Habitual constipation, clapotage of the stomach as far as the abdomen. *Liver large, extending three centimeters beyond ribs.* After some months' treatment the liver resumed its normal dimensions."

These are all initial processes, and become a disease only through their intensity or long duration. They are, doubtless, many of them at least, active congestions.

In conclusion, let me refer briefly to two cases that have been under my observation recently: —

CASE I.

L. M., male, aged six. Growth stunted, small for his age, very poorly nourished, pale and slightly cyanotic, extremely nervous and irritable; frequently had palpitation of the heart. Appetite enormous, and he frequently ate between meals; bowels irregular. He slept but little.

Physical examination showed a flattened and underdeveloped chest, a weak and irritable heart, which was very rapid, and had a characteristic pendulum beat, and was displaced about one inch to the left. The liver was enlarged, reaching in the nipple line well up into the fifth intercostal space, and below a full finger's

breadth below the ribs; tender to pressure; splenic dullness negative. The abdomen was markedly enlarged, and somewhat tender to pressure, especially in the vicinity of the umbilicus. Flatulence and clapotage.

CASE II.

H. P., male, aged thirty-six. Average build, poorly nourished, cyanotic. Appetite ravenous; had indulged in all kinds of dietetic intemperance; used flesh foods to excess. Complained of insomnia, palpitation of the heart, constipation, great nervousness, and at times severe mental depression; also complained of frequent fainting spells, sometimes quite severe, lasting several hours, and of great physical weakness, lassitude, loss of ambition, etc.

Physical examination showed a weak heart, somewhat enlarged, reaching just beyond the left nipple line; marked dilatation of the stomach, with prolapse, and general enteroptosis; splenic dullness slightly increased; liver enlarged, but not markedly; sympathetic ganglia very tender; no icterus; clapotage; stomach reached well below the umbilicus; pulse a little rapid; arteries distinctly hardened, giving a thready and small pulse.

A RETROVERTED UTERUS THE CAUSE OF SCIATIC NEURITIS.

BY C. C. NICOLA, M. D.,
Superintendent of the New England Sanitarium, South Lancaster, Mass.

MRS. M. was brought to the New England Sanitarium October 5, suffering excruciating pain in the left limb, along the course of the sciatic nerve.

History.— Age, forty-five; the mother of five children. Since the birth of the youngest child, fifteen years ago, she had been troubled with pain in the back, weight and heaviness in the pelvis, and profuse menstruation every two or three weeks, accompanied by great pain. About the middle of last September, the patient rode twenty miles in a buggy, and spent some hours in picking grapes, which required a great deal of reaching. The next morning she awoke with pain extending down the left limb, especially in the foot, which became so severe by 10 A. M. that she was compelled to go to bed. The pain was excruciating, particularly at night, and so persistent that ordinary measures gave very little relief, and her physician was obliged to resort to morphine and other hypnotics. The patient was unable to lie down on account of the increase of pain when in the recumbent position, especially the dorsal. She had suffered in this way for six weeks before coming to the Sanitarium.

Examination.— Examination at the time of her arrival showed the circumference of the left thigh to be one and one-half inches less than that of the right. Great tenderness existed along the course of the sciatic nerve and its branches. The uterus, which was large and heavy, was tipped back into the hollow of the sacrum, and was so fixed that it could not be replaced; while a very sensitive spot was found in the left side of the pelvis.

Treatment.— An operation for correcting the uterine displacement was advised as soon as the sciatic pain should be relieved sufficiently to allow the patient to lie in the dorsal position. For the pain, continuous heat, alternate hot and cold applications, counterirritation, electricity, massage, and other measures were all tried, with but little effect. The electric-light bath gave great relief for a short time, but the pain persisted, and very soon recurred in all its intensity.

As the patient could not remain long at the Sanitarium, she urged that the operation for the uterine difficulty be performed without waiting for the relief of the sciatica. She was accordingly etherized, and the uterus thoroughly curetted, after which it was replaced bimanually. Kellogg's operation for shortening the round ligaments was performed, each ligament being shortened about five inches.

To the agreeable surprise of both the patient and her physicians, it was found after the operation that the pain in her limb had entirely disappeared, and that she could lie on her back with comfort, and rest easily all night, neither of which she had been able to do since the attack began. She made a good recovery from the operation, was walking about in three weeks, and with the exception of a few slight twinges in her foot when she first used it, the pain has been absent. Subsequent examination showed the uterus

in good position and decidedly reduced in size. The patient left December 4, feeling better than she had for years. January 10 she reported that her general health was still improving, and that she had had no recurrence of her troublesome symptoms.

The chief point of interest in this case is the clear evidence that the distressing sciatic neuritis was brought on by mechanical causes, and that it was readily relieved by mechanical measures. It is probable that the long ride over a rough road just before the attack, and possibly the reaching during the grape-picking, had wedged the heavy, retroverted uterus back into the pelvis, producing such pressure on either the sacral plexus or the sympathetic nerves that by the next morning a pressure neuritis in the sciatic nerve existed. This cause continuing, it is not strange that our best efforts directed to the periphery of the nerve availed so little. Almost immediately after the heavy uterus was lifted and secured in position by the operation, the pain disappeared, and the patient was able to lie down, even in the dorsal position, with comfort, because the uterus could no longer impose itself upon the inflamed nerves.

The Urine as a Diagnostic Factor. — Dr. Kernode (*Tri-State Med. Jour.*, p. 369, August, 1898; *Amer. Med. Surg. Bull.*) concludes an article with the above title with the following succinct rules, formulated by a Dr. Formad and verified by many investigators: —

1. Sediment in the urine has no significance unless deposited within twenty-four hours.

2. Albumin in the urine does not indicate kidney disease unless accompanied by tube casts. The most fatal form of Bright's disease — contracted kidney — has little or no albumin.

3. Every white crystal in urine, regardless of shape, is a phosphate, except the oxalate of lime crystal, which has its own peculiar form; urine alkaline.

4. Every yellow crystal is uric acid if the urine is acid, or a urate if the urine is alkaline.

5. Mucous casts, pus, and epithelium signify disease of the bladder or cystitis of other parts of the urinary tract, as determined by variety of epithelium.

6. The urine from females can often be differentiated from the urine of males by finding in it the tessellated epithelium of the vagina.

7. Hyaline casts (narrow), blood, and epithelial casts signify acute catarrhal nephritis. There is much albumin in this condition.

8. Broad hyaline casts and epithelial dark-green granules and oil casts signify chronic catarrhal nephritis. At first, much albumin; later, less.

9. Hyaline and pale granular casts and little or no albumin signify interstitial nephritis.

10. Broad casts are worse than narrow casts, for the former signify a chronic disease.

11. The urine should be fresh for microscopic examination, as the micrococci will change hyaline casts into granular casts or devour them entirely in a short time.

12. Uric acid may, in Trommer's test for sugar, form a peroxide of copper, this often misleading the examiner into the belief that he has discovered sugar. Thus, when urine shows only sugar, the other methods of examination must be used, — preferably the lead-test.

13. The microscope gives us better ideas of the exact condition of affairs in examination of urine than the various chemical tests. — *Med. Times, November, 1899.*

The Dangers of Atmocausis.—Von Guévard (*Cobl. f. Gynäkologie*, No. 35, 1899) reports a case which had undergone an operation for ventrofixation, with the result that she improved and continued in health until interrupted by pregnancy. After delivery, persistent secondary hemorrhages occurred, for the relief of which atmocausis was employed. Cessation of menses resulted following the operation, but at the menstrual periods unendurable pains were felt, becoming intensified as time went on. The uterine cavity was obliterated by the steam jet, so that the sound entered for about two centimeters only. This necessitated the performance of a total hysterectomy. The author believes that atmocausis was to blame for this condition. He also believes that the severe hemorrhage was in part caused by the preceding operation of ventrofixation. — *Medical Review of Reviews, Nov. 25, 1899.*

TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

AUTOINTOXICATION THE CAUSE OF GRAVES'S DISEASE: WITH A REPORT OF TWO CASES.

CHAS. L. MINOR, M. D. (*Medical Record*, Dec. 2, 1899), after reviewing briefly the various theories relative to the causation of Graves's disease, states that even Bouchard, in his classic book on autointoxication, does not mention the subject; yet, recalling the oft-proved virulence of the ptomains produced in the intestine, and their violent effects on the nervous, vascular, and glandular systems, what can be more reasonable than to infer that they have some effect in the causation of a disease often ushered in, or rather preceded, by digestive disturbances, diarrhea, flatulence, and chlorosis; in a disease the majority of whose victims are of that sex whose bowels are rarely free from fermentation and ptomain formation; in a disease in which Chevalier and Boinet and Silbert have demonstrated ptomains in excess in the urine, pointing to a probable fermentation in the alimentary tract; in a disease in which urticaria, angioneurotic edema, dermographism — troubles so frequently associated with intestinal putrefaction — are so common?

In substantiation of this theory the author cites the following cases: —

CASE I.

Miss C., aged twenty-two. Family history negative, with the exception of neurotic taint in the maternal grandmother. At the age of seventeen she had typhoid fever followed by malaria of the tertian type. Her digestion prior to 1893 was good, though she was subject to constipation. Her appetite was always capricious, and her eating very imprudent. Her average weight in health was 130 pounds.

Her present history dates from the summer of 1893, when, on account of numerous malarial attacks, symptoms of acute indigestion, which were characterized by violent pain in the lower abdomen, began to appear. These attacks came on about two hours after eating, and were not accompanied by diarrhea, and were generally traceable to indiscretions in diet. After proper exercise and a carefully regulated diet the patient improved somewhat, but later on, after much social overexertion, the patient noticed that she was getting pale; she felt dragged out, had poor appetite and slight fever. It was evident at this time that a typical chlorosis was setting in. For this disorder tonics and a regulated diet were prescribed, but were not carried out with any persistency by the patient. In the fall of 1896 she first noticed, as the result apparently of much exercise which she took on her physician's advice, a rapid heart action, for which she was put to bed, but without benefit.

In January, 1897, a diagnosis of Graves's disease was made. The patient was sent to Baltimore for treatment, where she received the usual line of treatment prescribed for such cases, including electricity, belladonna, digitalis, nux, ice-bags, and rest. She was discharged March 26, somewhat improved. The patient stated that the benefits derived from the treatments were slight, but evident, and the effects were soon lost after returning home.

In May, 1897, the author took charge of the patient. At this time there was a blowing systolic murmur, loudest over the mitral area, but not transmitted to the axilla; *bruit de diable* in neck; noise of heart sounds heard in the ears constantly by patient; pulse 130, but while at rest, regular; nervous system irritable, the patient having lost her former even temper, and being so cross as to be hard to live with; sleep poor; slight tremor of the hands. The digestive system showed evidences of active intestinal fermentation with overdistended intestines; tongue coated, breath foul, bowels costive.

There was a moderate degree of exophthalmus, most marked on the left side, Graefe's sign absent; Stellwag's sign present; thyroid gland visibly enlarged, especially on left side; circumference of neck twelve and one-half inches; normal size probably about eleven inches. Skin muddy, with acne eruptions; weight 123 pounds. Strength poor; hemoglobin sixty-five per cent. To the personal knowledge of the writer, the patient was known to subsist on an overrich and

highly seasoned diet. She was a most capricious eater, eating at any and all hours, as the mood struck her; she was very fond of candy, and was with difficulty induced to obey any orders.

Knowing that the usual remedies had been employed in this case, and that there was an indication that the disease was due to digestive disturbances, the author directed his efforts toward relieving the same. A strictly regulated diet was ordered, from which almost all sugars were excluded, and starches were carefully limited. A few simple green vegetables were allowed, also some red meats, and a little chicken. Tea, coffee, hot breads, made dishes, condiments, and candy were proscribed; meals were to be taken at regular hours, and during the first month quiet and repose was demanded. Later gradually increasing exercises were permitted. The chief method used in combating the fermentation was a modified form of lavage. This was given to the patient at bedtime. In the administration of the lavage the patient lies on the right side, with the hips higher than the shoulders, the right side being insisted on in order to make the flow from the splenic to the hepatic flexures easier. One quart to one gallon of hot water (100° to 105° F., or even hotter) is allowed to flow slowly into the rectum through the usual rectal nozzle until the colon is full. This measure increases the flow of bile, thus lessening putrefaction. Free diuresis is also produced, and if the water is hot enough, diaphoresis as well, thus powerfully disintoxicating the system. Under this treatment the patient rapidly gained in strength and weight; fermentation was markedly decreased; she was less irritable, and the neck measurement was considerably less, as was also the pulse. With the exception of certain periods in which the patient lapsed with respect to her care in diet, the recovery was uneventful, and on April 12 the patient weighed 138 pounds; pulse 80 after playing golf all the morning; tongue clean; no flatulence; digestion good; complexion nearly as good as formerly; color admirable.

CASE II.

Mrs. D., aged forty-seven. Family history negative. She was a great tea drinker, but had no alcoholic habit; a fast eater and a great gormand. Her present trouble dates from May, 1897, when, after a wetting, she got cold, which terminated in fever and a bilious attack, vomiting of bile, and pain in the base of the right lung, in the liver region. The fever continued for some time, but after rest in bed and careful dieting she got well. During July, at times after eating she had pain in her stomach. In September she had fluttering in the pit of the stomach and a sinking feeling. An examination at this time showed the pulse to be 160, and a pronounced pulsation of the abdominal aorta in the epigastrium. On the 10th, when called in, I noted a pulse of 120, coated tongue, strong pulsation and systolic bruit in the epigastrium below the heart, to the left of the nipple line. The pulsation was so great as to suggest the possibility of an aneurism. The patient confessed the excessive tea habit, flatulence, and the custom of eating between meals whenever she felt hungry. Globus hystericus was present; the eyes were shiny, but only very slightly prominent. The thyroid showed a medium sized enlargement on the left side, hard to the touch, which had existed for years.

The treatment was similar to that in the previous case. The improvement was marked. The attacks of epigastric pulsation and tachycardia, which had so frightened her and caused fear of death, were soon very much improved, as was also the digestion. On discharge the pulse was 80, and the eyes still rather shiny. The attacks were entirely removed.

From the symptoms in these cases and the results obtained from treatment directed toward the improvement of the digestive disturbance, the author is justified in believing that at least in a number of cases this disorder originates from putrefactive changes taking place in the alimentary canal.

HELPS IN THE DIAGNOSIS OF LOCOMOTOR ATAXIA.

HUGH T. PATRICK, M. D. (*Medicine*, November, 1899), in a paper treating of the diagnosis of locomotor ataxia, concludes with an epitome from which we quote the following:—

"1. Loss of knee-jerk.

"2. Reflex iridoplegia (the Argyll-Robertson pupil).

"These two are *par excellence* the ob-

jective signs of locomotor ataxia, and any patient who has no patellar tendon reflex and whose pupils contract with accommodation, but not to light, is in all probability suffering with this disease.

"3. History of lightning pains. The typical lancinating pains of locomotor ataxia are pathognomonic. They occur at irregular, generally rather long, intervals, and rarely last more than a day or two, generally a few minutes or two hours.

"4. Disorder of the vesical function — a relative retention, a relative incontinence, or both, as already described.

"5. Analgesia of the legs. To examine the tactile sense alone is to make a grave error of omission. In the vast majority of cases, sensation to disease is well advanced, whereas the perception of painful impressions below the knee is frequently blunted in the very early stages. Having learned that the patient is instantly aware of a touch which disturbs only the hair on the legs and never reaches the skin; to find that a pin may be thrust through a fold of integument without pain, is somewhat startling, but it is not an unusual finding.

"6. A history or other evidence of specific disease is of major importance, provided infection has not occurred too recently.

"7. Ocular palsies, coming on suddenly, especially if more or less transient, are strong corroborative evidence of locomotor ataxia.

"8. By far the greater number of cases of primary atrophy of the optic nerve are due to tabes, and this atrophy, with one or two indubitable signs, is quite sufficient for a diagnosis.

"9. Very important in the way of confirmatory evidence are the various atypical pains and paresthesiæ, of which may be instanced numbness along the distribution of the ulnar nerve, in the legs and feet, in the perineal and anal regions or about the trunk; long-continued intercostal neuralgia; epigastric distress relative of mealtime or choice of food; and a feeling as if the rectum contained feces or a foreign body.

"10. In about eighty per cent of all tabetics a more or less complete zone of anesthesia may be discovered around the body at about the mammillary level.

"11. Analgesia of the ulnar nerve is frequent in tabes, quite rare in the normal individual, and infrequent in all other diseases except general paresis. When in the normal person, the ulnar nerve is forcibly pressed against the inner condyle or condyloid ridge of the humerus,— a maneuver that is not difficult of execution, — and there is very considerable pain at the point of pressure. It is the absence of this pain which is diagnostic.

"12. The peculiar normal testicular pain on pressure is said by Pits to be absent in seventy-five per cent of the tabetics. I can not confirm the figures, but I can attest the frequency of the symptom.

"13. When present, fully developed gastric crises are almost pathognomonic, and require but little confirmatory evidence. The same may be said of the typical arthropathies.

"14. Diminished sexual power alone is of absolutely no value. An overwhelming preponderance of such cases are of psychic or local origin.

"15. Before inco-ordination appears, one can ordinarily demonstrate impairment of what is currently called the muscular sense, but what were better named sense of position or sense of motion; that is, the patient is unable to appreciate such slight passive movements of the toes or of an extremity as are at once perceived by the normal individual.

"16. Ataxia. It may always be found by careful examination before the patient is aware of its presence.

"17. Persistence of painful impressions, especially on the legs. For instance, a quick pin prick or pinch is perceived as a long stinging or burning sensation.

"18. Muscular hypotonus; that is, the muscles are unnaturally lax and flaccid."

Surgical Hints.— Never use morphine before anesthesia in patients who are in a state of stupor or traumatic shock. In these the drug has a distinct tendency to increase these conditions.

Never have any more assistants at an operation than is absolutely necessary. They are apt to get into each other's way, and the more people help you, the greater the difficulty of securing asepsis.

Excepting in emergency cases, every patient about to be operated upon is entitled to as careful examination as if he were applying for life insurance, and to treatment before the operation, for any complicating condition.

When using cocaine hypodermically, it is seldom necessary to use a solution stronger than one per cent, and then always have the patient in a recumbent position. The danger of cocaine lies in the possibility of syncope from failure of the heart's action, and lying down is the best preventive.

While operating, never put too many instruments in one tray, as it becomes more difficult to find just what you want. It is best to have several small trays, and to put the cutting instruments in one, the artery forceps in another, and the special instruments required in the particular operation you are doing in a third, while the needles occupy a fourth.

During the removal of tumors having many attachments, it is a good principle to free first all the points that are easily detached, and to pediculate the tumor, as it were, where it is most difficult to free it. This will usually result in the largest vessels being included in the pedicle, so that with your ligature or clamp you may safely secure the most dangerous region, and cut above it without danger.

In old ovarian lesions, it is often a fact that the patients show a decided insufficiency in the secretion of urea. It is well to subject such patients to preliminary treatment for this condition, for two reasons: The first is, that if the proper treatment increases the excretion of urea, the patient will have a better chance of recovering from the operation; and the second is that if the patient's urine shows no improvement, the prognosis is rendered more serious, and forewarned is forearmed.—*International Journal of Surgery, November, 1899.*

Meningitis and Pseudo-meningitis in Influenza.— Sassi (*Gl'Incurabili*, An. 14, F. 17 and 18), from the difference in clinical symptoms manifested in meningitis, accepts the division into meningitis and pseudo-meningitis. The majority of the latter cases presenting meningitic symptoms recover, and the former die. Both types may occur as the direct or indirect result of influenza. Infection may occur through the nose, pharynx, ear, or eye. It is not essential that Pfeiffer's bacillus be found, as the same results may be produced by the toxins of influenza.

In trying to differentiate an influenzal meningitis from other forms, useful criteria may be found (1) in Shelley's sign (the presence of a sago-like eruption on the palate and lips); (2) in the influenzal tongue, presenting a peculiar opaline — bluish-white, porcelain-like — appearance, which resists purgative treatment, and lasts throughout the disease; (3) in the study of the temperature, which presents irregular rises, each rise a little less than the preceding, and with marked oscillations between the morning and evening temperatures; (4) in lumbar puncture.

Formaldehyde as a Milk Preservative.— A. G. Young (*Proceedings of American Health Association*, November, 1899; *Medical Record*, Nov. 11, 1899) makes the following conclusions in regard to the action of formaldehyde as a preservative of milk: —

1. Used as a preservative it tends at least to impair the nutritive value of milk.

2. It tends to interfere with the digestive processes. In either case it is only a question of dosage, and the limit of safety is difficult to determine.

3. Though the inhalation of formaldehyde gas is much less dangerous than the breathing of the other gaseous agents much used as disinfectants, the results of tests upon animals, and of one case of accidental poisoning of a human being indicate that formaldehyde taken into the digestive system may produce dangerous and even fatal results.

4. It would be unwise and unsafe to encourage or to suffer the use of formaldehyde in the public milk supply, even under any possible restrictive regulations.

5. In every State, as is now the case in many, there should be a law prohibiting, with effective penalties, the use in milk of any chemical preservative whatsoever.

Maternal Impressions. — H. F. Lewis (*Amer. Jour. Obst.*, XL, 84, July, 1899) argues against the psychic influence in the production of monstrosities. If true, the theory of maternal impressions ought to explain every case, but thousands of monstrosities are born without any history of an impression, and there are many cases of impression not followed by the birth of a monster. If it were true, it ought to be possible to

classify monstrosities in species and genera according as they were due to certain casual impressions, such as from dogs, cats, and elephants. Internal anomalies about which the mother did not even know, such as congenital diaphragmatic hernia, bifid uterus, etc., could not be explained in this way. It is not conceivable that a mental influence could remove a part of the fetus already formed; neither could it add anything. The strongest blow dealt to the theory comes from the results of the experiment. All malformations and monstrosities can be explained by purely physical and mechanical causes, entirely remote from psychic influence, so that there is never any reason to invoke the mysterious or the supernatural to explain natural phenomena.

Degeneration of Medullated Nerve Fibers.— G. Mönckeberg and A. Bethe (*Arch. f. Mic. Anat.* Bd., LIV, 1899) described the results obtained by some of the newer and more refined methods of nerve technique, which promise to throw light upon the earliest degenerative changes occurring in the nerves. The normal axis cylinders of medullated nerves are shown to consist — in vertebrates — of individual fibrils, sharply defined, and lying in a homogeneous peri-fibrillar substance. The fibrils are of sensibly uniform diameter, and have no thickenings at the nodes of Ranvier, as older drawings indicate. The sheath of Schwann sends down processes at the nodes of Ranvier,— constricting bands, which interrupt the myelin sheaths at the nodes. The first pathological changes observed in the nerves seemed to occur in the fibrils of the axis cylinder. The staining reaction of the fibrils is altered at first, and shortly after, the fibrils themselves begin to swell and coalesce into granular bodies. These granular bodies are of large size. Later they break up or disintegrate into smaller particles, which are eventually absorbed. The homogeneous peri-fibrillar substance also exhibits at an early stage fine granular changes.— *British Medical Journal, Dec. 9, 1899.*

The Dangers of Caffeine.— The Indian *Medical Record* for July 12 contains a statement made by M. K. Zenetz, of Varsovic, relative to sudden death by arrest of the heart in systole from the use of caffeine.

He cites three cases: First, a woman free from any organic lesion, feeling indisposed, took every two hours a powder containing thirty centigrams (4.5 grains) of citrate of caffeine. After the fifth dose she fell down in a state of syncope, from which she was aroused with difficulty. After recovery she continued to take caffeine, and died suddenly after taking another five powders. The second was a case of pneumonia. The patient died suddenly after taking during two days one gram citrate of caffeine. The third was a woman suffering from nephritis. She died suddenly when taking caffeine.

A post-mortem examination of these cases showed the heart to be so firmly contracted that it was difficult to cut it with the scalpel.

Caffeine is eliminated by the kidneys, and can be found in the urine from ten to fifteen days after discontinuing its use. — *N. Y. Medical Journal.*

An Easy Method of Showing the Presence of Acetone in Urine and in Other Animal Fluids.— The agent which C. Oppenheimer advises for demonstrating the presence of acetone in the urine and in other fluids is composed of hydrarg. oxid. flavi., 50; acid. sulphur conc., c.c. 200; aq. dest., c.c. 1,000. The sulphuric acid should be dissolved first in the water, then the oxide of mercury. After twenty-four hours the solution should be filtered. The method is as follows: To about 3 c.c. of the urine to be examined the reagent is added, drop by drop. In albuminous urine the fluid becomes turbid immediately; in normal urine, only after the addition of a certain quantity of the reagent. By the further addition of drops of the reagent, a precipitate occurs, which no doubt contains uric acid, creatinin, and also a portion of the oxy-protein acid of Gottlieb. If the precipitate remains when the fluid is shaken, then a few more drops of the reagent are added, and the solution is allowed to stand for two or three minutes, until the precipitate has thoroughly settled. Now the fluid is filtered until the filtrate is perfectly clear; 2 c.c. of the reagent is added, and 3 or 4 c.c. of a thirty-per-cent sulphuric acid, and the

mixture heated over the flame for a few moments. If a precipitate now occurs, acetone is present in abundance.— *Medical Review, Oct. 21, 1899.*

The Treatment of Soft Chancres by Means of Steam.— E. K. Manfawovsky (*Vratch; Jour of Cutan. and Gen.-Urin. Dis.*, July, 1899) says that in eighty-nine cases of chancre the diagnosis was made clinically, not by demonstration of the Ducrey bacillus. Among them twenty were accompanied by buboes, and one with necrosis. The localization was on different parts of the penis. The author placed the end of Professor Shegirer's steam apparatus at a distance of four to eight centimeters, and subjected the sore to the action of escaping steam at 50° to 60° C. for three to ten minutes. The surrounding healthy tissues were protected by means of gauze. After from one to two minutes the floor and edges of the sore under the influence of the steam became pale, then rose-like in color. Later, after three or four sittings, the sore begins to bleed, and takes on a healthy appearance. A complete cure was obtained by the author after ten to fifteen sittings.— *Medical Times, November, 1899.*

The Etiology of Neurasthenia.— John Punton, M. D., in a lecture to the students of the University Medical College, Kansas City, Mo., which appears in the Kansas City *Medical Index Lancet*, January, 1900, states that the causes of neurasthenia, whether predisposing or exciting, include heredity, environment, education, trauma, occupation, alcohol, tea, coffee, tobacco, opium in all its forms, acute infectious diseases, as well as excesses of all kinds.

Electricity for Sprains.— Charles O. Files calls attention to the use of static electricity in the treatment of sprains. His technique is as follows: A thick woolen shawl, folded many times, is placed over the ankle and foot, and the static massage roller is used as strong as the patient can bear it, for fifteen minutes on the foot, ankle, and leg. The patient is seated on a stool on the floor, not on the insulated platform. The roller is attached by a chain to the positive pole.— *Railway Surgeon.*

Danger-signals of the Pre-eclamptic State.—Jewett (*Brooklyn Medical Journal*, August, 1899) calls attention to the advisability of physicians' being more careful in their search for danger-signals in the pre-eclamptic state. The author states that the first indications of danger are to be sought in the urine. The detection of the presence of albumin in the urine is of great value, but this is not the only substance to be looked for. The amount of urea must be carefully watched. As long as the urea elimination is between four and five hundred grams a day, there is little cause for anxiety. The daily quantity of urine voided must also be carefully noted; the patient should be instructed to measure it carefully one or two times a week. If this plan were systematically employed and the amount of urine kept above three pints a day, convulsions in childbed would be almost unknown.

Action of X-rays on the Skin.— Lambin (*Monats. f. prak. Derm.*, No. 10, 1899) has investigated the action of X-rays on both healthy and diseased skin, and comes to the following conclusions: (1) The action is beneficial in cases of lupus, chronic eczema, destruction of hairs growing on moles, and occasionally in cases of acne, lupus erythematous, favus, psoriasis, elephantiasis, hypertrichosis, and freckles. (2) On the other hand, the following accidents may result from the use of X-rays: Dermatitis of varying severity, sometimes followed by abscess and necrosis, alopecia, pigmentation, and desiccation of the epidermis.— *British Medical Journal, Sept. 20, 1899.*

Tuberculous Strictures of the Intestine.— Guinard (*Bull. Et Men. de la Soc. de Chir. de Paris*, March 28, 1897) cites the case of a girl, aged seventeen, who was tubercular, and showed symptoms of intestinal obstruction, for the relief of which condition the author resected three and one-half feet of the ileum. On examination of the resected portion of the bowel, four distinct strictures were observed. Indications of obstruction had existed from early childhood, and it was ascertained that all four strictures were the result of cicatrices formed in old tuberculous ulcers. Six days after the operation the patient was in a very satisfactory condition.— *British Medical Journal, Dec. 30, 1899.*

Decrease in the Mortality from Consumption.— In the report for 1898 of the Massachusetts Board of Health a steady and uniform decrease in the mortality from consumption in that State is pointed out. In 1853 the deaths from it were 4,272 per million people. In 1895 the number was only 2,194, and the report for 1898 shows further decrease. The causes of this remarkable change, states the report, are of a similar character with those which have affected nearly the entire class of infectious or preventable diseases; namely, a better knowledge of the art of prolonging life, a growing appreciation of the value of sanitary measures which are essential to success in the campaign against infectious diseases. Another means which has been recently adopted in Massachusetts is the establishment of a special State hospital for the isolation and treatment of persons afflicted with tuberculosis.— *Medical News, Dec. 16, 1899.*

Hemophilia.— G. W. Wagner, M. D., after a careful study of the literature on this subject, concludes in a paper in the *Physician and Surgeon*, September, 1899, that—

1. Hemophilias make blood rapidly, the cause of which fact is undetermined.
2. There is a tendency to plethora of the smaller vessels, especially of the capillaries.
3. The deficiency of oxygen in the blood is one of the main reasons for its slow coagulation.
4. The narrow lung space, at least in some cases, is a factor in the deficient oxygenation of the blood.
5. Apparently the best remedy to control the hemorrhage is oxygen, either by inhalation or contact. This acts in two ways; it causes greater rapidity in the coagulation of the blood, and also causes the nuclei of the endothelial cells of the capillaries to swell and thus lessen the lumen of the vessels.

A New Test for Hydrochloric Acid in the Gastric Contents.— Siringo (*Rif. Med.*, July 4, 1899) publishes a preliminary communication on the value of salt of nitrohydroxylamin in the detection of free hydrochloric acid in the stomach contents. These salts, when in the presence of free hydrochloric acid, are decomposed with the development of an almost theoretical quantity of nitrogen dioxide, from the estimate of which the amount of free hydrochloric acid may be inferred. The weak organic acids, acetic, lactic, etc., in dilute solutions, have no action on the substance in question, nor are some salts of nitrohydroxylamin decomposed by acid phosphates.—*British Medical Journal, Dec. 30, 1899.*

Ligation of the Uterine Arteries in Cancer of the Uterus.— Loewy (*La Gynecologie*, June 15, 1899), in a communication addressed to the Paris Anatomical Society, criticises the operation from an anatomical standpoint, showing that it does not retard the progress of the disease. When the disease is in the operable stage, hysterectomy is always preferable, and, if that is impossible, curettement and cauterization offer a better prospect of arresting the hemorrhage than ligation of the uterine arteries.—*Am. Jour. Med. Sciences, December, 1899.*

Fish as Conveyers of Tuberculosis.— According to the French correspondent of the *Medical News*, Nicholas and Lesieur presented to the Society of Biology the results obtained by them in feeding young fish with sputum known to contain tubercle bacilli. After a period of seven months the fish were killed, and a careful bacteriological examination made, with the result that every organ of their bodies was found to be diseased. Guinea pigs fed on the muscular portions of these fish contracted the disease, which was manifested in nodules and abscesses. In these the tubercle bacilli were readily observed.— *New York Medical Journal, Dec. 16, 1899.*

Marmorek's Serum a Failure.— Macé has reported before the Société Obstetricale de France that the employment of Marmorek's serum in the treatment of streptococcic infection is a failure. Others of prominence also indorsed his views. The report of the committee of the American Gynecological Society at its recent meeting reported adversely. The Institut Pasteur is also reported as being adverse to its use.

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

The Bacterium of Eclampsia.— Levniovitsch (*Cent. für Gynak.*, No. 46, 1899) finds that there is a definite germ in the blood of eclampsia. In 44 cases of puerperal convulsions the author found this micro-organism present. They appeared as large round and oval cocci, very motile. The oval were the larger. In twenty-eight cases the blood was added to broth, gelatin, and agar, and in twenty-five of the samples the cultures were identical. The cocci grew best on nutritive media consisting of placental tissue. The cocci when cultured were of different shapes, and bore flagelli. They were sometimes found in the blood before the first fit. Indeed, they were detected in several persons not in the present series who had no convulsions, but suffered from headache, vomiting, and edema. During the first fit the cocci were most abundant, and in about two days after the last fit they steadily diminished in number. At the same time an involution form of the coccus appeared, the center not taking the aniline stain. Pure cultures acted pathologically on guinea pigs. Within a month they died of acute anemia caused by hemorrhagic endometritis. Subcutaneous injections of pure cultures in non-gravid rabbits frequently set up tetanic spasms of short duration in different sets of muscles. Occasionally the cocci were detected in the blood of the infants of eclamptic mothers; in two infants fits occurred.

Transmission of the Agglutinating Substance of the Eberth Bacillus through the Milk.— Courmont and Cade (*Lyon Medical*, Sept. 3, 1899, p. 5) report the case of a mother who had nursed her two-months-old baby for two weeks after she was taken ill with typhoid fever. Three days after the child was taken from the breast, it was found that its blood possessed the agglutinating power in a dilution of 1:10, while the mother's milk showed a positive reaction at 1:30, and her blood 1:200. Eight days after weaning, the infant's blood failed to produce the reaction. The case, therefore, serves to confirm the observations of Landouzy and Griffon and Castaigne, and to demonstrate the possibility of transmitting to a nursling certain properties acquired by the blood serum of the nurse, and the passage of these substances through the mucous membranes of the infant. The occurrence of the changes in the fluids of the nursling appears to depend upon two factors — the intensity of the changes in the nurse's blood serum and the duration of the transmission by ingestion of her milk. This influence is but temporary, and ceases within several days after nursing is suspended.— *Am. Jour. Med. Science, December, 1899.*

The Beard as a Source of Infection. — Huebener (*Centralbl. für Chir.*, No. 11, 1899) found by holding petri dishes containing agar a short distance under the beard while a sterile instrument stirred the same lightly that 42.3 per cent of twenty-six beards thus examined contained pus-producing germs.

Clinical Investigations of Frequency of Microbes in Blood.—C. de Fine Licht (*Nordiskt Mediciniskt Arkiv*, June 30) states that tests with one part blood to ten parts bouillon kept in the thermostat for a day or so, developed colonies of microbes in case of several febrile diseases in thirteen out of seventy-two subjects with various affections. The conclusions are that bacteria, and most frequently the staphylococcus, will be found in almost all fevers produced by pyogenic microbes, as well as by the typhoid bacillus, the pneumococcus and other similar bacteria, when the temperature has risen above 39° C. When the microbes once enter the blood, they may linger in it a long while, three months in one case of phlebitis and another of appendicitis, even though the temperature may have returned to normal, or below. The microbes were found in the blood without evidences of fever in only two cases,— one a patient with ileus, who died with intestine intact, and temperature under 38°C. when the staphylococcus was first noted in the blood. The other was a fatal case of diabetic coma, the staphylococcus discovered the day before death,

while the comatose condition was still incomplete. —*Journal of the Am. Med. Association, Aug. 12, 1899.*

The Influenza Bacillus and Pneumonia. — W. H. Smith, M. D. (*Jour. of the Boston Soc. of Med. Sciences*, May, 1899), as a result of his investigations, arrives at the following conclusions: —

1. Cases of pneumonia caused by the influenza bacillus may give few, if any, signs clinically of their presence beyond a moderate degree of fever and a few fine, moist râles, more or less circumscribed.

2. The influenza bacillus by itself is capable of producing pneumonia; however, the pneumococcus is frequently associated with the influenza bacillus in its production.

3. The type of the pneumonia is usually broncho or lobular, frequently consisting of multiple foci, with a tendency to involvement of the lower lobe of the left lung.

4. Upon microscopic examination the exudate is composed largely of cells, chiefly of leucocytes. The amount of fibrin present in the exudate is small. Bacilli usually are present in large numbers inside of the leucocytes, both in the alveolar spaces and in the bronchi.

Typhoid and Colon Bacillus Differentiation.—Piorkowski describes a new method for rapidly differentiating these bacilli by means of a new culture medium. He uses forty-eight-hours-old urine, of a specific gravity of 1.020, that has become alkaline. To this he adds one half per cent peptone and 3.3 per cent gelatin, boiling the mixture one hour over a water bath, filtering it, and putting it into test-tubes. These are sterilized for fifteen minutes and again on the following day for twenty minutes. Twenty hours thereafter the bacillus coli commune appears in round, yellow, finely granulated and sharply defined colonies; typhoid on the other hand appearing as a ray-like growth centrifugally arranged very much like the ray fungus.—*Medical Standard, June 1, 1899.*

The Rôle of the Meningococcus in Meningitis.— Netter (*Societe de Biologie*, June 17, 1899), reporting twelve cases of cerebrospinal meningitis in which the meningococcus or diplococcus intracellularis meningitidis was found, apparently still adheres to his views expressed in the *Twentieth Century Practice.* The accepted view of the epidemicity of the disease caused by this organism is not recognized by this observer. Chantemesse, opposing Netter, speaks for the recognition of the epidemic nature and specific character of the meningitides associated with meningitis. Netter's ideas that the meningococcus is a derivative and degenerate form of the pneumococcus seems to Chantemesse quite erroneous.

Griffon identifies one organism of Netter's, "the streptococcus derived from the pneumococcus," as the "streptococcus meningitidis of Bonome." — *Am. Jour. of Med. Sciences, October, 1899.*

Ozone as a Means of Destroying Germ Life in Water.—Th. Wey, in the *Centralblatt f. Bacteriologie*, June 26, 1899, reports a series of experiments on the action of ozone on bacteria in drinking water. These were carried on in the laboratories of Siemens and Halske, where ozone was developed by electrical methods. The results would seem to show that the water could be rendered bacteria-free by this process, and in a large experimental research the plans were elaborated for the wholesale application of the process to purify the water of the Spree, furnished to the city of Berlin. The experiments carried on delivered 80,000 liters of ozonized Spree water in twenty hours, which water was as free from bacteria as the sand-filtered water utilized by that city. Organic matter was also considerably reduced in quantity by the process. The author suggests the use of such apparatus instead of the sand-filtration methods, since he believes the results obtained were better. — *Medical Record, Oct. 7, 1899.*

Sunlight on Bacillus Icteroides.— Tests at the La Plata Hygienic Institute have confirmed the fatal action of sunlight on the bacillus dried or diluted with water, according to *Anales de Buenos Ayres*, 3 and 4, but it has been found that anerobic cultures are very much more resistant, also bacilli in clothing and sand. When exposed to the sun in nutritive media, they do not perish, but their growth is very much retarded.—*Journal of the Am. Med. Association, Oct. 21, 1899.*

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PRINCIPLES GOVERNING THE APPLICATION OF HYDRIATIC MEASURES FOR THE REDUCTION OF TEMPERATURE IN FEVERS, AND METHODS EMPLOYED.[1]

1. A GENERAL cold application increases both heat production and heat elimination. Which of these effects is dominant depends upon the duration and intensity of the bath.

2. A general cold application, if very brief, causes no perceptible loss of heat, and may occasion, by thermic reaction, a slight temporary rise of temperature.

3. A prolonged cold application lowers the temperature by increasing heat elimination, and also finally by diminishing heat production, through the general sedative effect upon the nervous system and the cooling of the thermogenic tissues in the muscles.

4. The prolonged tepid bath lowers the temperature, by increasing heat elimination without increasing heat production.

5. The appearance of chill and shivering marks the beginning of the lowering of the body temperature, and diminished elimination accompanies it as a conservative measure, while increased heat production begins.

6. Coldness and dryness of the skin, goose-flesh appearance, chilliness, blueness of the surface, are indications for the use of measures to increase heat elimination; that is, means to encourage the cutaneous circulation.

7. A short general hot application (one half to two minutes) diminishes heat production by its reflex effect upon the heat centers, and increases heat elimination by increasing the skin circulation and the production and evaporation of perspiration.

8. A long hot bath raises the temperature by heating the body and increasing heat production.

9. In general, tonic thermic reaction should be, so far as possible, suppressed in fever cases by avoiding short cold applications and measures involving mechanical effects, such as the douche.

10. Gentle friction during a cold bath increases heat elimination by stimulating the surface circulation, and controls heat production by maintaining the skin temperature and thus preventing shivering.

Laschkiewitsch showed that death after varnishing is due to excessive cooling from paralytic dilatation of the cutaneous vessels.

The notion that hydrotherapy is chiefly useful in fevers as a means of lowering the temperature is based upon a very superficial knowledge of the rationale of this marvelous therapeutic agent. Winternitz wrote nearly twenty years ago: —

"The hydriatic antipyretic method consists in an antithermal procedure, together with applications which act upon the nervous system and the circulation in a manner analogous to nerve tonics and sedatives, and in tonic-raising features which influence nutrition in a favorable manner as well as in local measures, or reducing hyperemia and congestion, whereby morbid processes may be controlled."

In view of this important fact, which is still quite too rarely recognized, it is evident that a routine practice, even in the treatment of fevers, is quite impossible. The procedure must be carefully chosen, and adapted to the needs of the individual case. In certain cases of fever, thermic reaction must be wholly suppressed or as nearly so as possible; in others a moderate amount of thermic re-

[1] From the forthcoming work, "Rational Hydrotherapy."

action will prove beneficial. In threatened collapse, thermic reaction must be encouraged.

Methods That May Be Efficiently Employed in the Various Morbid Conditions Accompanied by a Rise in Temperature.— Of the various measures which may be employed for the reduction of temperature, the following may be mentioned as having been tested in actual clinical experience, not only by the author, but by numerous able clinicians. All have been found useful and efficient, some being best adapted to one particular set of circumstances, others to other conditions, but each having its peculiar utility; for rational hydrotherapy gives no countenance to routine methods, and recognizes no panacea:—

1. *The Tepid or Cold Affusion.*—This method, first employed by Hippocrates, and in recent times revived by Currie and Jackson, is efficient in lowering temperature. The mortality rate in scarlet and typhoid fevers is reduced by its use from thirty to forty per cent to almost nothing. The patient simply sits in a large tub, while several pails of water at the ordinary temperature, or about 70° F., are poured over him, this procedure being repeated as often as the temperature reaches 102° F.

Currie observed that the warm affusion (87° to 97° F.) is more effective in reducing temperature than the cold, offering in proof the following excellent reasons, which are certainly highly creditable to the sagacity of this pioneer of rational hydrotherapy, considering the fact that his observations were made more than a hundred years ago:—

"I find that, in many cases at least, the heat of the living body is lowered as speedily by the affusion of tepid water as by the affusion of water that is cold. If I mistake not, in some cases the heat is lowered more speedily by the tepid water."

The principal reason for the greater effect of the tepid bath in lowering the temperature, Currie finds in the fact that it is "little if at all stimulating, and does not, like the cold affusion, arouse the system to those actions by which heat is evolved and the effects of external cold are produced. If the object is to diminish the heat, this may be obtained with great certainty by the repeated use of tepid affusions."

He further makes the following very wise observation: "I have accordingly employed the tepid affusion very generally in those feverish affections where the morbid actions are weakly associated, depending rather on the stimulus of preternatural heat than upon contagion, miasmata. . . . It is also applicable to every case of fever in which the cold affusion is recommended."

Currie also used the "cool bath" (75° to 85°), but employed it most in chronic diseases. He preferred, however, the cold bath in contagious and infectious fevers, evidently for the reason that baths of this temperature are the most effective in arousing the vital forces of the body to resist and antagonize disease.

2. *The Cold Immersion Bath.*— This bath was first systematically employed by Brand, who by its means reduced the mortality from typhoid fever more than two thirds. The method of Brand requires that the patient be placed every three hours, day and night, in a bath at 68° F., for fifteen minutes. Brand requires the administration of the bath whenever the rectal temperature of the patient reaches 102° F. At the beginning of the bath, he directs that an affusion of water at 59° F. be slowly poured upon the back of the patient's neck for two minutes, and that the patient drink freely of water during the bath.

After the bath, the patient is placed in a sheet in which he is wrapped and carefully dried, but without rubbing the abdomen. The patient is only slightly covered after drying, and may contiune

to shiver slightly for some time after the bath, as an indication of the actual lowering of the body temperature occasioned by the bath. Twenty minutes after the bath the temperature is taken and recorded.

The amount of reduction of the temperature by the cold bath may be from half a degree to three or four degrees, seldom more than one or two degrees, and not infrequently there is a slight rise immediately after the bath. This is especially true at the beginning of a fever. Later the effect is greater.

CHRISTIAN SCIENCE HUMBUGGERY.

It certainly seems to be about time that the mummeries and dangerous pretensions of the "Christian Science" fad were taken seriously in hand by the law for the protection of human beings who have not the sense or the knowledge whereby to protect themselves.

In her work, "Science and Health," Mrs. Eddy undertakes to deal with obstetrics, giving the following directions among others equally absurd and incoherent: "To attend properly the birth of the new child, or the divine idea, you should so detach mortal thought from its material conceptions that the birth will be natural and safe. Though gathering new energies, an idea should injure none of its useful surroundings in the travail of spiritual birth." Dr. Frank S. Billings published recently in the New York *Times* the following account of the Christian Science method of dealing with obstetrical cases:—

"Mrs.—— was the pretty young wife of a clerk. Her mother was a maniacal Christian Scientist. When it came time for Mrs.—— to be confined, the husband was told he might go to business, and the mother (mother-in-law) took the case in hand, aided by a Christian Scientist healer. The poor girl began to suffer, and the fool women put a Bible on her abdomen and told her that her pains were all imagination, that the Lord never gave people pain, and so on, *ad nauseam.* The agonies of that poor child must have been terrific, for neighbors heard her screaming and begging for a physician, but these Christian friends never let up. Finally the pain stopped; no further screaming was heard. The reason was that the child had ruptured the womb, and was in the abdominal cavity of the mother. Then there was rushing in mad haste. The husband was sent for, the physician was sent for, but too late; the woman died of hemorrhage, and the child choked to death. Two murders! But were these women prosecuted? — Not a bit of it. Public sentiment was entirely on their side, and no official dared to issue a warrant. 'It was God's will to take his dear ones that way,' said the minister (not a Christian Scientist) at the funeral."

The writer has encountered a number of instances in which the results of Christian Science treatment were scarcely less horrible than in the case above reported. In one case, a woman suffering from hemorrhage from a uterine tumor, was allowed to die, while being assured from day to day by the Christian Science attendant that there was nothing whatever the matter with her; that she could not be suffering from hemorrhage, for there is no such thing as hemorrhage, especially uterine hemorrhage, because there is no such thing as a uterus; all is mind, thought, spiritual essence. The poor woman died in spite of the daily assurance that there was nothing the matter with her.

BEEFSTEAK AND CANCER.

It has long been known that tuberculosis is frequently communicated to human beings by the use of meats, especially beef and mutton. Sheep and cattle are

extremely subject to this disease,— much more so than the horse or the goat. The latter animal was formerly supposed to be quite free from tuberculosis, but more recent studies of the subject have shown that even the goat and the donkey have sometimes succumbed to this malady.

It has also been known for many years that the tapeworm is, in at least nine cases out of ten, as pointed out by the late Professor Leidy, of Philadelphia, due to the use of beef. Mr. Jasper More, a member of the British Parliament, having had his attention called to the increase of cancer among cattle in England, has made a thorough investigation of this matter, and has discovered that cancer affecting the lips and the throat is very common among cows and oxen in various parts of England, and he brings forward this fact as an explanation of the rapid increase of cancer in certain portions of England and Wales.

This subject is one which ought to receive most earnest attention in this country as well as in England. The inside of the mouth is seldom examined, hence cancer might exist in the throat of an animal without being discovered by the inspectors. The use of the flesh of a cancer-infected animal, unless very thoroughly cooked, would be very likely to give rise to the development of this most incurable malady in susceptible persons.

Attempts have been made to trace the origin of cancer to the use of vegetable foods of various sorts, but wholly without success. We must find the seat of this parasitic disease in the same source in which nearly all other human parasitic maladies originate; *viz.*, the use of dead carcasses of diseased animals. The human race is paying a terrible penalty for the inhumanity of the ruthless butchery of animals and the consumption of their flesh as food.

Dr. Hemmeter, the eminent professor of disorders of the stomach, in the Johns Hopkins University, calls attention to the confirmation of the observations made by other eminent clinicians, — that cancer of the stomach is increasing at an extremely rapid rate.

Is it not time to begin to think about discarding the cow, the pig, and other forms of food so liable to disease, in exchange for the fruits, grains, and nuts which nature provides in pristine purity?

GENERAL REVULSIVE EFFECTS OF THE HOT AND COLD COMPRESS.

GENERAL revulsive effects may be advantageously employed in such disorders as cholera, chronic rheumatism when the joints are universally affected, and in cases of heat stroke in which the surface is pale. The hot and cold compress is useful as a measure in all forms of shock and collapse, as a means of combating internal congestion. Revulsion in these cases may be sought without care to suppress the thermic reaction; hence it is not always necessary to precede the cold application by a hot one, although as a rule this is desirable when it can be accomplished without too much delay, and the cold application may be continued long enough to obtain the excitant or tonic effect.

The lumberman brings the blood to his blanched and freezing feet by pulling off his boots and socks and rubbing the parts with snow. The Persians combat the collapse from cholera by vigorously rubbing the surface with cold water. In accordance with this idea, it has been the practice from time immemorial in Persian cities to place upon every street-corner vessels of water during epidemics of cholera; and if a person falls upon the street, the bystanders immediately deluge him with water, and rub the whole surface of the body with the greatest vigor.

The author has for many years made use of a similar means in collapse under

anesthesia, in surgical shock, and in similar cases, preferring, however, whenever possible, to make the cold application short, and to precede and alternate it with a hot application. In this manner both an excellent circulatory reaction and simultaneously a calorific effect may be obtained.

The hot immersion bath may sometimes be used with advantage as a revulsive measure for the relief of visceral congestion, as in acute nephritis, especially in the nephritis of scarlet fever. It is equally useful in cerebrospinal meningitis. The hot blanket pack may be successfully used in the same conditions. Care must, however, be taken to guard the head by a large towel saturated with cold water; and if the heart is feeble, or seems unduly excited, it should be protected by an ice-bag placed over it during the bath, or by a cold chest compress.

When the suppression of thermic reaction is not necessary, as when purely revulsive effects are not required, the alternate douche may be employed instead of the Scotch douche. In this douche the applications of heat and cold are of equal length. The extremes of temperature are as great as can be borne, provided the exciting effects of such an application are not contraindicated; the alternations should be eight or ten in number. The application may be renewed several times a day, or as frequently as required.

In place of the alternate douche, the alternate foot bath, alternate affusion, alternate compresses, and various other forms of applying heat and cold in alternation may be used, the measure being adapted to the case in hand.

The alternate douche differs from the Scotch douche in that it is primarily exciting rather than calmative or sedative in its effects. It is one of the most exciting of all hydriatic applications. Nevertheless, it often relieves pain by its powerful revulsive effect.

Ether Spray in Neuralgia.— Hamm has recently revived interest in the ether spray as a means of treating neuralgia and localized headaches. Ether spray is an old remedy, the value of which has been established for many years. It has no superiority, however, over the revulsive compress, consisting of a very hot fomentation continued for three or four minutes, followed by a very cold application by means of cloths wrung out of ice water, and continued from fifteen to twenty seconds.

THE OVERTHROW OF THE NEURON THEORY.

On account of the rapid advances made in histological technique, the theory so universally accepted and so vigorously advocated by Ramon y Cajal, Von Lenhossék, Golgi, and many others— that the cells of the nervous system are distinct individual units — seems to be overthrown by the careful researches of Gerlach, Held, Bethe, Rüzicka, Dogiel, and the more recent researches of Martin Fischer. The latter in his investigations employed the Golgi method and a modification of the Nissl method of tissue preparation and staining, thus:—

"(*a*) The tissue is hardened in a ten- to twenty-per-cent solution of formalin, cut with a freezing microtome, or dehydrated, embedded in celloidin or paraffin, and sectioned.

"(*b*) The sections, which should not be too thin, are stained from one to twenty-four hours in a solution of Grübler's soap methylene-blue which has been diluted with an equal amount of water.

"(*c*) The specimen is rinsed in water, and dehydrated, and differentiated in aniline-oil alcohol (1·20).

"(*d*) It is then cleared in oil of cajeput, and mounted in Canada balsam."

By this method the cells are overstained, and the cell processes, branch-

ings, and subbranchings are stained a considerable distance from the cell body. The neighboring structures are also stained so that the relation of the neurons to the surrounding structures can be carefully studied. This manner of coloring also brings Nissl's bodies out clear and distinct, and according to Fischer (who has given an account of his researches in the *Journal of Experimental Medicine*, Vol. IV, Nos. 5 and 6, September and November, 1899), "it is now an easy matter to see that the nerve cells are not separate individuals, but frequently anastomose with each other." "The relation of two cells is not always one of mere contact only, but one of actual connection between the protoplasm of one cell and that of the other."

Fischer by his investigations confirms the work of Sala, who, working with Golgi's method, claims that the dendrites embed themselves in the blood vessels, and as a result of his (Fischer's) investigations, he concludes as follows:—

1. The neuron theory, in so far as it claims the absolute independence of the neurons, is an untenable one, as anastomoses between them have been found.

2. The dendrites, which are generally believed to have but nervous function, may have also nutritive function, if such an inference is permissible from the existing anatomical relations, which show some of the dendrites embedding themselves in the walls of the capillaries.

C. E. S.

REVIEWS.

CHRISTIAN SCIENCE. — An Exposition. By Hon. Wm. A. Purrington, lecturer in the University and Bellevue Hospital Medical College, etc. E. B. Treat & Co., New York.

This work deals in a very logical and intelligent manner with one of the most harmful fads which has afflicted civilized communities in modern times, — the so-called "Christian Science," of which Mrs. Eddy, of Boston, claims to be the discoverer or originator. The author is a lawyer, and an especial student of medical jurisprudence, and treats the question in an incisive and thoroughgoing way. He deals in a masterly manner with the question of "Christian Science Before the Law," presenting facts and principles which ought to be at the command of intelligent men and women everywhere, and which ought to lead to an organized effort throughout the country to secure the enactment of laws which will protect the public from one of the grossest forms of malpractice. So far, efforts to secure the passage of such laws have generally failed, because of the clamor against the infringement of individual rights. We quote the author's remarks upon this subject as follows: —

"To legislate for the benefit of any scientific theory to the detriment of another would be, save perhaps in very exceptional circumstances, a great wrong, unwise, and most harmful to the cause of true science and the advancement of human knowledge. A statute, for example, ordaining that no person should worship except according to the Roman Catholic or Presbyterian scheme, or treat the sick except *secundum artem*, whether by regular homeopathic or any other rule, would be an abomination, unwise, and, God be thanked, unconstitutional.

"Because no well-informed person disputes these truisms, charlatanism, religious and medical, seeks to make of them its refuge and strong bulwark. The Mormon for his polygamy, the Oneida communist for his promiscuity, the Christian Scientist for his slaughter of credulous adults and helpless babes, alike claim protection from the law upon a theory that the free right to worship according to conscience implies the right to commit any act under the pretext of religion which an evil or erratic mind may inspire. The osteopath, the venopath, the vitapath, the Kickapoo Indian, and all the rabble of ignorant quacks in like fashion seek exemption of their impostures from legal regulation in the contention that because the last word has not been uttered in medical science, it is therefore class legislation to enact any law prohibiting the ignorant to assume as a business the entire charge and cure of the sick. At first blush, this superficial argument is plausible, and influences many. When Æsop's ass masqueraded under the lion's skin, all the other animals, intelligent man included, stood for a while in awe of him; but when his tuneful note vibrated on the air, they tore off his disguise, and disclosed him once more an obvious ass. In the long run the disguise must fall from pseudo-religious and medical imposture. Christian Science will not be an exception to the rule. Its mask of religion is very thin, but the animal below it is rather the cunning fox than the honest, useful ass. In tearing off its disguise, the law may play a part; but the unmasking will best be done by turning on the light and showing what an amusing misfit the garb of religion is, and what a greedy, unscrupulous fox it covers."

A POCKET MEDICAL DICTIONARY giving the pronunciation and definition of the principal words used in medicine and the collateral sciences, including very complete tables of clinical eponymic terms of the arteries, muscles, nerves, bacteria, bacilli, micrococci, spirilla, and thermometric scales, and a dose list of drugs and their preparations, in both the English and metric systems of weights and measures.— By George M. Gould, A. M., M. D., author of "The Illustrated Medical Dictionary," "The Student's Medical Dictionary;" editor of the Philadelphia *Medical Journal;* president, 1893–1894, American Academy of Medicine.

Fourth edition, revised and enlarged; 30,000 words. P. Blakiston's Son & Co., 1012 Walnut St., Philadelphia, 1900. Price, $1.00.

The fact that this dictionary has gone through four editions, and that over one hundred thousand copies have been circulated, is ample evidence that the work is one of value. This edition has been thoroughly revised and enlarged until it now contains the pronunciation and definition of over thirty thousand medical words. Besides this it contains tables giving the origin, distribution, etc., of the arteries, the habitat and character of bacilli, bacteria, micrococci, and spirilla; origin of insertion, innervation, and function of the various muscles; function, origin, distribution, and branches of the nerves; character, condition in which heard, of rales; comparison of thermometers; weights and measures; tests; doses of official and unofficial drugs in both the English and metric systems of weights and measures; symbols and abbreviations. The tables alone are well worth the price of the book. The publishers are to be recommended on the beauty and durability of the book. To those requiring a pocket medical dictionary we heartily recommend this one.

The "World Almanac and Encyclopedia" is a book of 600 pages, and contains everything in the way of statistics that an editor needs to know. It will prove an indispensable desk companion for all busy people. The Press Publishing Co., New York *World*, Pulitzer Building, New York. Price, 25 cents.

Napoleon Bonaparte appears in the March *Century* in a new rôle — that of a temperance advocate. In the second installment of Dr. O'Meara's hitherto unpublished "Talks with Napoleon" at St. Helena, it is recorded that, having a pain in his side, the ex-emperor asked his physician to show him where his liver was situated; and the latter, in some remarks on the causes of the inflammation of that organ, mentioned intoxication as one of them. Thereupon Napoleon remarked: —

"Then I ought not to have it, as I never was drunk but once in my life; and that was twenty-four years ago, at Nice. . . . I drank three bottles of Burgundy, and was completely drunk. O, how sick I was the next day! I wonder how a man who once gets drunk can ever think of doing it again. Such headache, vomiting, and general sickness; I was nearly dead for two days."

PAMPHLETS RECEIVED.—"Imperfect or Deficient Urinary Excretion as Observed in Connection with Certain Diseases of the Skin;" "How Far Has Specialism Benefited the Ordinary Practice of Medicine?" L. Duncan Bulkley, A. M., M. D., New York.

"Strangulated Hernia." Parker Syms, M. D., New York City.

"Complications of Diphtheria;" "Gastrointestinal Infections in Infants;" "Spasmus Nutans." I. A. Abt, M. D., Chicago.

"The Tuberculin Test, and the Need of a More Complete Diagnosis of Tuberculosis." Charles Denison, A. M., M. D., Denver, Colo.

"Acute Inflammation of the Middle Ear Complicating Scarlet Fever and Measles." Charles H. May, M. D., New York.

"Hygiene of the Nose." W. Cheatham, M. D., Louisville.

"Some Interesting Genito-urinary Specimens." Bransford Lewis, M. D., St. Louis.

"A New Operation for Persistent Inversion of the Uterus." Barton Cooke Hirst, M. D., Philadelphia.

PUBLISHERS' DEPARTMENT.

THE London *Lancet*, of London, England, one of the highest medical authorities, has made an elaborate analysis of protose, and Aug. 26, 1899, published its report as follows:—

"Our analysis of protose was as follows: Moisture, 64.22 per cent; proteids, 21.30 per cent; fat, 10.23 per cent; mineral matter, 1.40 per cent; carbohydrates, 2.85 per cent. Chemically, therefore, it presents the composition of animal tissue,— beef or mutton. The fat exhibited a low melting point, and was easily saponified, so that it would probably be readily digested. The flavor of the preparation is not unpleasant, and somewhat meaty. Protose is unquestionably a food of some merit."

As the above report was wholly unsolicited by the manufacturers, and was made solely in the interest of the public, we take pleasure in presenting it as a guarantee of the correctness of our claim that the composition of protose is identical with that of meat, that this preparation tastes like meat,

The Battle Creek Sanitarium

LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, M. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR FEBRUARY.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
103 per cent.		1	1
100 " "	68	31	99
98 " "	10	10	20
95 " "	15	15	30
93 " "	6	10	16
91 " "	1	2	3
88 " "	4	2	6
85 " "	2	1	3
83 " "		1	1
78 " "	2	8	10
71 " "		4	4
Below 70		2	2
Total	109	86	195

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	66	27	93
Between 4,500,000 and 5,000,000	16	21	37
" 4,000,000 " 4,500,000	12	15	27
" 3,500,000 " 4,000,000	10	13	23
" 3,000,000 " 3,500,000	2	4	6
" 2,500,000 " 3,000,000	1	2	3
Below 2,500,000	2	4	6
Total	109	86	195

Examination of Sputum.— There were 9 examinations made, 5 being new cases. Tubercle bacilli were found in 2 cases.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	42	84	8	61	27	60	77	72
Less than 10,000 bac	6	12	3	24	10	23	19	18
Between 10,000 and 100,000 bac	1	2	2	15	5	12	8	7
More than 100,000 bac.	1	2			2	5	3	3
Total	50	100	13	100	44	100	107	100

The patients were received from the following States and countries: Michigan, 24; Illinois, 12; Ohio, 8; Indiana, 7; Wisconsin, 6; Iowa, 5; Minnesota, 5; Tennessee, 4; New York, 3; Montana, 2; South Dakota, 2; North Carolina, 1; Texas, 1; Pennsylvania, 1; Maryland, 1; Kansas, 1; California, 1; Canada, 1; Japan, 1; unclassified, 21. Total, 107.

Urinary Laboratory.— Total number of specimens examined, 539; number of new cases, 204; number of cases having albumin, 13; casts, 34; sugar, 6; pus, 159; blood, 5.

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is easily digestible, and is a pure and wholesome substitute for flesh food.

SANITAS NUT FOOD CO., LTD.,
Battle Creek, Mich., U. S. A.

THE SAMUEL D. GROSS ONE-THOUSAND-DOLLAR PRIZE.

No essay which the trustees deemed worthy of the prize having been received on Jan. 1, 1900, they hereby announce that the prize will be awarded on Oct. 1, 1901.

The conditions annexed by the testator are that the prize "shall be awarded every five years to the writer of the best original essay, not exceeding one hundred and fifty pages, octavo, in length, illustrative of some subject in surgical pathology or surgical practice, founded upon original investigations, the candidates for the prize to be American citizens."

It is expressly stipulated that the competitor who receives the prize shall publish his essay in book form, and that he shall deposit one copy of the work in the Samuel D. Gross Library of the Philadelphia Academy of Surgery, and that on the title-page it shall be stated that to the essay was awarded the Samuel D. Gross Prize of the Philadelphia Academy of Surgery.

The essays, which must be written by a single author, in the English language, should be sent to the Trustees of the Samuel D. Gross Prize of the Philadelphia Academy of Surgery, care of the College of Physicians, 219 S. 13th St., Philadelphia, on or before Oct. 1, 1901.

Each essay must be distinguished by a motto, and accompanied by a sealed envelope bearing the same motto, and containing the name and address of the writer. No envelope will be opened except that which accompanies the successful essay.

The committee will return the unsuccessful essays if reclaimed by their respective writers, or their agents, within one year.

The committee reserves the right to make no award if the essays submitted are not considered worthy of the prize.

W. W. Keen, M. D., J. Ewing Mears, M. D., J. Chalmers Da Costa, M. D., *Trustees.*

MODERN MEDICINE

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ORIGINAL ARTICLES.

HYDRIATIC INSTITUTIONS AND THEIR EQUIPMENT, AND THE GENERAL MANAGEMENT OF CASES.[1]

BY J. H. KELLOGG, M. D.,

Superintendent of the Battle Creek (Mich.) Sanitarium.

IN the scientific use of water in the treatment of disease, elaborate apparatus is not essential for effectiveness. Indeed, it is possible to secure the most valuable of the therapeutic advantages of water by the aid of sheets, towels, blankets, a pail, a bath tub, and a thermometer, if coupled with the consummate skill which comes from long experience. There can be no doubt, however, that the best results of hydrotherapy are most readily and quickly attained by the aid of perfected apparatus especially designed and suited for bringing to bear upon the body the thermic and mechanical impressions which may be elicited from water. It may also be added in this connection, that, while it is true that no remedy lends itself so readily to all conditions and environments as does water, and while there are few morbid conditions which may not be greatly benefited by the use of such simple appliances as are usually found at hand, it is true beyond question that a very large number of cases, especially those of a chronic nature, may be much more satisfactorily treated and far more quickly restored to health by treatment in an establishment furnished with all the appliances for the most efficient use of water. It is not always necessary for the patient to live in such an institution, though he should be sufficiently near to make daily treatment possible without too great inconvenience; but in quite a large proportion of chronic cases it is important that the patient's whole life should be controlled,— the diet, exercise, and the entire regimen regulated in harmony with rational living,— in other words, that the patient should give himself, for the time being, wholly to the cultivation of health, in order to secure the desired results. Hence a few words may not be out of place in regard to the equipment requisite for an establishment devoted to the use of hydriatic measures.

The most necessary thing is an abundant supply of water. Soft water is preferable to hard, because of its better effects upon the skin, but mineral water offers no real advantage over the purest soft water. The slight advantages which may possibly be claimed for certain alkaline mineral waters, especially those containing carbonic acid gas and chloride of calcium, in the production of circulatory reaction at neutral temperatures, may, when desirable, be easily attained by the addition of the proper chemical substances. Soft water is much more readily absorbed than hard water or mineral waters, as has been shown by laboratory experiment. This gives it greater value when used at neutral temperatures for sedative effects.

A consideration of the greatest importance in relation to the water supply is the temperature, a low temperature being a very desirable quality. The summer temperature should not be higher than 55° F., and five to ten degrees lower is desirable. At a temperature above 60° it is difficult to obtain some of the most desirable hydriatic effects. It is not every case in which the powerfully tonic effects of water at 50° can be utilized, but means should be at hand for the production of the profound thermic and circulatory reaction which may be secured by water at this temperature, administered with proper pressure, in cases which may require it. In temperate climates there is no difficulty in obtaining water at a sufficiently low temperature during the cold months, but during the summer time the temperature of water conveyed for some distance in pipes often rises to 70° or even 75°. In such cases artificial means of cooling may be employed.

[1] From the forthcoming work, "Rational Hydrotherapy."

Water from deep wells and mountain streams is generally of a sufficiently low temperature for practical purposes.

In the empirical hydropathy of Priessnitz and his followers, cold water was the one thing needful; but in modern rational hydrotherapy, water is employed at all temperatures possible without injury to the skin; hence, suitable means of affording an abundant supply of hot water is required. Water may be conveniently heated by means of such a water-heater as is commonly used in laundries; or when the bathing establishment is heated by steam, it is usually most convenient and economical to heat the water in a boiler through which the steam is made to circulate by means of brass or copper pipes. If an engine is used for running a pump, elevator, or other machinery, the exhaust steam may be utilized in heating the water. Another method recently invented is the heating faucet, into which a steam pipe and a cold-water pipe are connected in such a manner that by the proper adjustment of the valve the steam and water may be mixed at the moment of escape, and thus water at any temperature desired instantly obtained. Water may also be heated by passing a steam pipe directly into the tank of cold water. This method, however, has the disadvantage of being extremely noisy. The noise may be somewhat lessened by fastening a suitable head to the open end of the pipe, but can never be entirely overcome.

Live steam is needed for the vapor bath, the Russian bath, and especially for the vapor douche.

Adequate pressure is a matter of utmost importance for a complete hydriatic establishment, it being essential for the different forms of the douche,—the most powerful if not the most essential of hydriatic procedures. The pressure needed is at least thirty to fifty pounds, representing a water column seventy-five to one hundred feet in height. A higher pressure is in no way undesirable, though not often required. When city water pressure can not be utilized, water may be pumped up into a tank placed at an elevation sufficient to give the necessary pressure. Each foot of elevation gives a pressure of about .45 of a pound. The pressure required may be obtained by means of a closed steel tank and an air pump. This device is much used in France, and is very satisfactory. In the absence of a better appliance, it is possible to administer the douche, and that in quite effective fashion, by means of an ordinary greenhouse spray pump. But in order to secure all the advantages of this most potent and admirable therapeutic agent, a complete and well-constructed apparatus must be provided. The douche apparatus being naturally the central feature of a well-equipped scientific establishment for the employment of hydrotherapy, it should not be clumsy or incomplete. The cost of a proper outfit, including a percussion douche nozzle with air pump and tank to operate, need not be more than $500 to $600 at the most.

The apartments devoted to the administration of baths should be carefully constructed for the purpose, and when possible, should comprise the following distinct compartments: An office, a waiting-room (the office and waiting-room may often be combined), a series of dressing-rooms, with cooling-room adjacent, general treatment-room, a room for douches of various sorts, a room for the administration of massage, packs, and fomentations. In addition to these there must be a water-closet, and provision for the administration of enemas and vaginal and rectal douches.

Special attention should be given to the ventilation of the apartments. The amount of air required per hour in living-rooms is estimated by Parkes at three thousand cubic feet. In bathrooms provision should be made for at least twice this amount of air, because of the great activity of the lungs and skin of patients during hydriatic treatment, and also because of the fact that the rooms are to be occupied by diseased persons, in consequence of which the air will become contaminated more rapidly than under ordinary circumstances. The maximum number of patients likely to occupy the rooms at any one time should be estimated, and provision made for five thousand to six thousand cubic feet of air per hour for each person. The air should be warmed before it enters the room. It may enter at any rate desired, but should not leave the room at a rate of more than five to seven feet per second. The outlets should be numerous and located on or at the floor and beneath the windows, so as to prevent the cold air which falls

along the outer walls from collecting at the floor, thus chilling the feet of the bathers. Ventilating shafts should be located in the inside walls, so that they will always be warm. If it is impossible to carry the shaft high enough to secure a strong draft, a suction-fan may be introduced, it being operated by steam, water, or electricity. Great care should be taken to avoid drafts, as the rapid evaporation from the skin produced by moving air readily gives rise to chill and most unpleasant effects. The temperature of the bathrooms should not be higher than 75° to 78° F. A temperature of 65° to 70° is preferable for the waiting- and cooling-rooms; while a temperature five to ten degrees higher may be allowed for the general treatment-rooms.

The floors of the waiting- and dressing-rooms should be made of hardwood, and waxed. If necessary, the floor may be covered with soft rugs, which should be taken out and shaken and sunned daily. The floors should never be covered with carpets, as these collect the dust, and often become musty, and contaminate the air. In apartments in which the floor is likely to be wet, as the douche- and the general treatment-rooms, the floor, or at least a portion of it, should be covered with tile, marble, slate, or concrete. The walls should also be of impervious material, preferably marble, and no crack should be left into which the water can enter, or to become filled with decomposable material.

If gutters are employed for carrying off the water (these should be depended upon as little as possible), they should be along the outer wall, and should be deep enough so that they will not readily overflow, and should be readily accessible so that they may be cleaned daily. No pipes of any sort should pass through the gutters, and there should be sufficient fall so that they will empty themselves rapidly.

Partitions should, as far as possible, be made of waterproof material. No woodwork of any sort should come in contact with the floor.

For fully equipped bath apartments at least the following appliances will be required:—

Bath tubs of proper construction for full, sitz, foot, running foot, shallow, and leg baths. An apparatus for administering douches of all sorts, including the vapor douche, is one of the most important necessities, and should be provided regardless of expense.

For good heat effects an electric-light bath and vapor or hot-air baths are needed, and for a large establishment it is well also to add the Russian bath. Electric-light apparatus should be provided for the administration of local light baths to the spine, legs, abdomen, and other parts.

Several large dippers, and pails properly constructed for the pail douche, should be provided, and there should be an abundant supply of linen and Turkish towels, linen and Turkish sheets, large soft woolen blankets, double blankets for the wet-sheet pack, friction mitts, a shampoo slab, manila or excelsior for shampooing, fomentation cloths, cheese-cloth for compresses, hot-water bags, both square and long, hot-water bags for the throat, and properly constructed sofas and couches. Several thermometers should be hung about the bath apartments in various places, by which to regulate the temperature. The thermaphore, when obtainable, may be employed instead of the hot-water bag.

It may be properly added, however, that the most elegantly equipped establishment for the administration of hydriatic procedures may be only the means for bungling and unscientific dabbling with human ailments, unless conducted under skilled medical direction and by the aid of attendants well trained in the versatile procedures of hydriatry. The hydriatrist must know not only that his apparatus and appliances are perfect and in perfect condition, but he must know exactly the condition of the patient to be treated, and must have a clearly defined rationale for each application made.

GENERAL RULES AND SUGGESTIONS.

It may be profitable to note a few of those conditions of the patient aside from distinct pathological states which have an important bearing upon the effects of hydriatic procedures.

The exact condition of the patient as he comes to the bath should be noted and taken into account, as it may be necessary to modify a procedure which was designated for him the day before or even the hour before. If he is in a state of exhaustion, for example, from overex-

ercise or loss of sleep or other cause, any very cold application will probably be inappropriate. If the patient is chilly, he must be warmed. Simply warming the feet by a hot foot bath may be the only heating measure needed; but if necessary, fomentations to the spine, a short hot immersion bath, a hot-blanket pack, or a hot rain douche just before the cold douche, may be employed as most convenient or as may seem to be indicated. If the patient is able, a few minutes' exercise, until gentle perspiration is induced, will, in ordinary cases, be found a more excellent means of preliminary heating than any form of hot bath, for the reason that exercise brings into full action the heat-making processes which the cold bath is designed to stimulate. If the patient is unaccustomed to cold water, his feelings should be respected, and the cold applications graduated in such a way as to avoid so unpleasant a shock as to distress or discourage him. If a patient is too feeble to help himself without more than ordinary assistance, the method of application must be modified to suit his case; as, for example, the shallow bath should be used rather than the rubbing wet sheet. If the patient has little power to react, his reactive ability must be stimulated by thorough heating before the bath by means of exercise, perhaps supplemented with a heating bath of some sort, as a vapor or an electric-light bath.

It is important to remember that patients are as likely to take cold in the treatment-rooms as elsewhere. The patient generally attributes his cold to a cold application, because during such an application he has experienced sensations of chill or shivering; but in this he is in error. If he has taken cold, it is because of the slow cooling which takes place by evaporation from an imperfectly dried skin after the bath, or because of a secondary chill occasioned by improper administration of the treatment. He can not take cold from a short, vigorous cold application followed by rubbing and a good reaction. The secondary chill must be carefully avoided. Chill is not infrequently produced by evaporation from the skin while the patient, who has perhaps had a heating procedure of some sort, is waiting for the completion of his treatment. The attendant should take care to see that such dangerous pauses in the treatment do not occur. The cold treatment must follow instantly upon the completion of the heating procedure. If from some accident or emergency a few seconds' delay occurs, the patient must be warmed up again by the administration of a hot rain or needle douche for a minute before the cold douche is given. Chilling of the feet by walking upon cold floors is doubtless in some cases the cause of taking cold. This may be obviated by the use of slippers. The heelless bath slippers, such as are generally used in the bathing establishments of Italy and Germany, are very convenient.

In general, moderate exercise for fifteen to thirty minutes should be taken both before and after a cold bath by patients able to exercise, but after a hot bath the patient should rest.

The training of patients to endure cold applications is a matter of the utmost consequence, and it requires considerable intelligence on the part of the attendant as well as the physician himself to conduct the process skillfully. While as a rule the temperature should be lowered a little each day, there will be occasionally a day when the patient's nerve tone is not quite up to par, when it may be necessary to return to the higher temperature employed two or three days previously. The day following, however, with improved nerve tone, rapid advance may be made toward the goal constantly aimed at in the average case; namely, the administration of water at a temperature properly designated as cold or very cold.

This training is especially necessary in the case of sedentary persons, such as are represented by the average business or professional man, teachers, and the wives and daughters from wealthy homes. Americans are as a class less able to bear water at a low temperature than are the English, the Germans, or the French. The reason for this is that Americans generally maintain their living-rooms at a higher temperature in winter, and load themselves with a mass of unnecessary clothing at night as well as during waking hours, so that the skin is generally relaxed, and possessed of little ability to react. The necessary reactive power may, however, be acquired by careful training, and the rapidity with which the patient comes to enjoy the most vigorous

cold procedures is frequently very surprising. The exhilaration which comes with the reaction following the bath is soon recognized as more than ample compensation for the slight unpleasantness occasioned during its application, and indeed it requires only short training to bring the patient to a point at which the really unpleasant symptoms at first experienced are no longer felt, or are mitigated to such a degree as to be scarcely noticeable.

It should never be forgotten, however, that very old, very young, and very feeble persons are incapable of enduring the very cold procedures suitable for ordinary adults, as their heat-producing powers are much less. Very cold baths must also be avoided in rheumatism, cardiac weakness, valvular disease of the heart, organic diseases of the brain and spinal cord, and degenerations of the kidneys, liver, heart, lungs, and other internal organs.

Very cold or very hot baths should be avoided just before or just after meals. The sitz bath should always be taken with the stomach empty, and the moist abdominal bandage should be removed during the meal, except in cases of gastric irritation in which it may be specially indicated.

From Schüller's experiments it is evident that the condition of the cerebral vessels should always be taken into consideration in the arrangement of the hydriatic prescription. Warm baths are contraindicated in cerebral anemia, for the reason that they would mechanically cause still further contraction of the cerebral vessels; while in pronounced cerebral congestion the application of very cold baths may be equally inappropriate in consequence of the intense though temporary cerebral congestion which they induce.

The success of hydriatic procedures depends as much upon the faithfulness and thoroughness of the attendant as upon the nature of the procedure itself. Every little detail must receive conscientious attention. No person can become qualified to administer hydriatic treatment in a satisfactory manner unless capable of following a prescription with absolute precision; and no person should be employed to administer treatment of this sort unless it is known that he can be fully relied upon to administer it in the manner indicated.

The attendant must never forget that nearly all procedures require a thorough cooling of the head, which demands bathing of the face and neck with cold water as well as complete saturation of the hair and wetting of the scalp. Women generally decline to have the hair wet, protecting it with a rubber cap so as to avoid the long delay necessary for drying the hair after the bath. This disadvantage may be obviated to a considerable degree by a thorough bathing of the face and neck with water colder than that of the proposed bath, and the application of a cold compress about the neck during the treatment.

If the bath is one requiring rubbing, it must be faithfully done, but not overdone, and as a rule it must be continuous from the beginning of the bath to the end of it. Interruption of the rubbing for half a minute may be sufficient to spoil the effect of the procedure altogether. When the patient is able, he must be constantly encouraged to assist in the rubbing, as the physical exercise thus involved is relied upon as a means of assisting reaction, and is an important factor in securing the good results expected of the procedure.

In procedures like the wet-sheet pack and the neutral bath, care should be taken to secure the greatest possible degree of quiet about the patient. Bright sunlight should be excluded by drawing down the curtains a little. Conversation, if allowed at all, should be suppressed. The patient should be disturbed as little as possible, no attention generally being required further than the changing of the cold compress applied to the head. If the patient is inclined to sleep during the bath, he should be allowed to do so. If the purpose of the bath is to obtain sleep, its duration may be extended beyond the usual limit, so long as the patient remains quietly sleeping, care being taken that no untoward effects are provoked by the accumulation of heat or other change in the conditions essential to the proper effects of the bath.

Quiet should always be maintained in the bathroom. Noisy talking, whistling, singing, and a bustling manner are entirely out of place there. Patients should not be encouraged to converse while taking treatment.

Particular attention must be given to drying and rubbing the patient after the bath. This portion of the procedure is

almost as important as any other, yet it is frequently neglected, even in the best-equipped and ably managed establishments. Attendants should see that the bath sheet is perfectly dry, but it should not be heated for a tonic application, as the contact of the heated sheet with the skin is likely to produce an atonic reaction, thus antagonizing the tonic effects of the bath.

The warm sheet may be applied after the neutral bath without harm, and the temperature of the sheet should at least be such that it will not produce the impression of cold when brought in contact with the skin. A Turkish sheet is to be preferred to the ordinary linen or muslin sheet for drying after the bath.

Extreme care must be taken to avoid chilling by evaporation after the neutral bath, as by this means the effect of the bath may be wholly destroyed. To this end the patient must be closely covered instantly when removed from the bath, special care being taken to avoid air currents about the neck and feet. Gentle rubbing over the sheet will facilitate the absorption of water by the sheet, and the patient may thus be rapidly dried without producing an undesirable reaction, either circulatory or thermic.

After a cold bath the patient must be thoroughly rubbed until a good reaction has occurred. Special attention must be given to the feet and legs, as these parts, particularly the feet, are very likely to become cold soon after the bath, through defective reaction, and may remain in this condition for several hours unless the patient's ability to react is good. When the circulation of the lower extremities is disturbed in this way, the cerebral vessels are dilated, and headache is likely to result. The patient should be first rubbed thoroughly with a towel or sheet, and afterward vigorously with the bare hand, the warm fleshy hand of the attendant greatly facilitating reaction. The patient is by no means dry when the skin ceases to feel wet. So long as the skin is soft and spongy, it still contains moisture which has been absorbed by the superficial layers of the epidermis. This absorbed moisture being left to evaporate after the bath, the patient becomes chilly, and contracts a cold, which he erroneously attributes to the bath, whereas the difficulty is wholly due to the ignorance or neglect of the attendant, or perhaps to the patient's own failure to observe the precautions suggested to him by his attendant or physician.

Rubbing, though thorough, should never be so vigorous as to produce irritation of the skin or to bruise or exhaust the patient. Excessive friction depresses the heart.

It is necessary to exercise great care to avoid burning patients when making hot applications. This accident is liable to occur in the treatment of patients who are in a state of insensibility from any cause, as from syncope due to chloroform, the stupor of fever, or sensory paralysis. In various forms of spinal disease there is a diminished sensibility and lowered vitality due to the presence of toxins, which greatly decrease the patient's ability to resist high temperatures, so that severe burns may occur from the application of a fomentation at a temperature which would produce no unpleasant effect when applied to sound tissue. The same is true of patients under the influence of an anesthetic, and in some forms of cardiac weakness, on account of the slowed movement of the blood.

Equal care must be taken to avoid freezing parts to which very cold applications are made continuously for a considerable length of time, especially in the use of the ice compress, the ice-bag, or the carbonic acid gas compress, especial care being necessary in the use of the last-named measure. Parts which may be completely surrounded by the cold application, as the hand, the foot, the scrotum, the ear, and parts in which the bones are thinly covered by flesh, are much more likely to suffer than are other parts of the body. In some parts, as the face, the cutaneous circulation is so active that there is very little danger of injury from this cause. It should be remembered, however, that in patients who are in a low condition, as in the ataxo-adynamic state of typhoid fever, the circulation is so sluggish that freezing occurs much more readily than in normal individuals.

Before putting the patient into a continuous bath, the skin should be oiled to prevent maceration and resulting irritation. The same precaution must be taken when fomentations are applied daily to a part, as for relief of pain in sciatica and in chronic joint disease. Oiling of the skin is also essential as a

protection against taking cold for patients who are under hydriatic treatment, especially during the cold season of the year. A little refined vaseline or cacao butter should be applied daily or every other day, after drying the patient.

Great care must be taken to keep the towels, sheets, and blankets employed about the bathroom in a thoroughly aseptic condition by frequent laundering. Towels should be boiled daily. The rashes resulting from the continuous use of the abdominal girdle, on which the empirical hydropaths dote so much, are in large part due to neglect to properly cleanse the wet bandage, which, being used day after day, accumulates fetid matter from the skin, and affords a favorable culture medium for the various forms of pus-producing microbes which are always present upon the skin. These rashes are never desirable, and may generally be prevented entirely by taking the precaution to apply vaseline to the skin and to boil the bandage daily. If the bandage is worn both night and day, it is well to employ a fresh one each night and morning.

(To be continued.)

EPILEPSY DUE TO AUTOINTOXICATION.

BY DAVID PAULSON, M. D.,
Chicago, Ill.

DOROTHY, aged four, was brought by her father, who is an eminent educator, to one of the Chicago hospitals to be treated for repeated daily attacks of both grand mal and petit mal, but with a history of only a few weeks' standing. The first attack was apparently precipitated by an unusual indiscretion in diet, and since then there had been a constant increase in number, until the seizures varied from three to twenty-five a day, the majority being of the petit mal variety. The child was placed under the care of a trained nurse, and was thoroughly bromodised. After two weeks, the dose had been so increased that the child's intellect was noticeably affected, and digestion had apparently almost entirely ceased. The child became so weak that she was unable to stand on her feet, and her mind was so much impaired that she did not even recognize her parents. The remarkable feature was that the attacks, instead of being lessened in number, were increased, without any particular diminution in their intensity.

After several weeks of this treatment, the father was given no encouragement of any improvement, and the child was brought to our Training-School ward. Inasmuch as the bromides had so signally failed, they were entirely discontinued, and the diet for a few days was restricted to fruits; afterward a few toasted foods, as granose, zwieback, malted nuts, and gluten gruel, were added. She was given neutral galvanic baths and massage daily, the treatments being administered by a trained Sanitarium nurse. At the beginning of the second day there was noticeable improvement, and within two weeks the attacks were decreased to but a few light ones each day. The child's mind had become nearly as bright as formerly, and she was again able to walk. Her father then took her home, accompanied by a nurse to continue the treatments and to have the direction of the patient's diet. In a few weeks the attacks entirely disappeared, and now, after nearly three months, there have been no seizures whatever.

This was evidently a clear case of epilepsy from autointoxication, which, instead of demanding sedative medication by drugs, proved the efficiency of an aseptic dietary and rational remedies in overcoming the effects of toxic products.

The Value of Water-drinking in Acute Hemorrhage.— L. Kolipinski (Maryland *Med. Jour.*, Dec. 30, 1899) advocates the liberal ingestion of water after temporary or permanent closure of the vessels in acute hemorrhage. The author cites the case of a girl, aged eighteen years, who was suffering from hemorrhage during an attack of typhoid fever. The patient drank twenty-four tumblerfuls of water in one night. The next morning she was much revived, pulse 108, and strong.

DR. V. C. VAUGHAN, professor of physiological chemistry and hygiene, and dean of the medical department of the University of Michigan, and late lieutenant-colonel of the Thirty-third Michigan Volunteers, U. S. A., has been elected surgeon-general of the Spanish-American war veterans.

TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

MASSAGE IN THE TREATMENT OF FRACTURES.

LUCAS-CHAMPIONNIÈRE (translated for the *Medical News*), after a very wide experience in the treatment of fractures by massage, states that it leaves nothing to be desired.

Moderate movement favors the repair of fragments of the bone. When movement is permitted, the callus will be greater in quantity, more solid, and more rapidly thrown out. Any large amount of movement will inhibit the process of repair, or at least seriously interfere with it. Moderate movement preserves the vitality of the limb and the suppleness of the articulations, the muscles, and the tendons. It entirely prevents the occurrence of any muscular atrophy. In every case, therefore, in which moderate movement does not threaten to cause the occurrence of deformity, the limb should not be immobilized. On the contrary, an attempt should be made to keep up passively, if not actively, the movements that are necessary to the vitality of the parts.

In addition to this passive movement, massage, which especially favors the repair of traumatic lesions of muscles, tendons, ligaments, and articulations, may always be applied in practice on the single condition that the parts involved in the fracture do not thus become the subject of untimely interference with repair. We may apply massage to fractures immediately after an accident, on condition that this massage is of the special kind that can be performed while the fractured member is properly supported. Massage, if undertaken in the ordinary manner, or if administered too energetically, would certainly result lamentably. The massage for a fracture ought to be applied to all parts of the limb, along the muscles, over the ligaments, and upon the hemorrhagic effusions, but never just over the site of the fracture nor directly upon the fractured ends of the bones. The massage ought to consist of gentle, repeated pressure, always in the same direction, from the periphery of the limb toward the trunk. It should be sufficiently prolonged. The length of time spent at massage will depend somewhat upon the character of the lesion and the sensitiveness of the patient, but at least from a quarter of an hour to twenty minutes once a day should be devoted to it.

The massage should never give pain. It should always be followed by an attempt at passive movements of the joints of the limb, which procedure must also be accomplished without pain.

The first effect of massage should always be to cause anesthesia of the part, so that all pain that has existed previously should disappear after its employment. The massage causes rapid resorption of all exudations and especially of hemorrhagic effusions. It preserves the suppleness of the part, and prevents muscular atrophy. It exercises without doubt a most favorable and deep-seated action upon the nutrition of the limb, preserves its vitality, and keeps its functions in readiness for service, instead of permitting them to degenerate by disuse.

When a member has been massaged, and passive movement has been practiced for the treatment of a fracture, the repair of the break is much more rapid than if apparatus for absolute immobilization were used. The deformity is much less marked because from the very beginning the muscular contraction, which is so powerful an agent in the production of these deformities, has been made to disappear. Finally, the member which has always remained supple, which has suffered no interference with its articulations, and no atrophy of its muscles, is not only more quickly, but more completely cured by the treatment. On the other hand, after the application of apparatus, especially of irremovable apparatus, a long period must elapse in order to complete the cure, and a second treatment by passive movement must be undertaken to overcome the consolidating action which the apparatus has produced.

These principles of treatment, the author says, should be applied to all fractures. There is only one contraindication. If deformity threatens to result, that and that only should prevent the surgeon from using this method or hamper him in its application. We can treat absolutely without any apparatus, by

massage and mobilization alone, the large majority of the fractures of the wrist, the radius, or Colles's fractures. The larger number of fractures of the clavicle are amenable to the same method. In four years at the Hospital Beaujon the author has had in his practice more than sixty cases of fractures of the clavicle. He has treated all of them without apparatus, using only a simple sling, and not once has he had occasion to apply any other form of treatment. All the fractures of the upper extremity of the humerus as far down as the insertion of the deltoid may be treated in this way. All the fractures of the lower extremity of the humerus, all the fractures of the elbow, including those of the olecranon, most of the fractures of the fibula, a large number of the fractures of both malleoli, many fractures of the knee, and all the fractures of the scapula are best treated in this way.

Besides these, many of the fractures which can not be treated with absolutely no immobilization yield better results when treated by a mixed method. The apparatus should be used after a preliminary massage and removed from time to time in order to permit of further massage. Even in fractures of the femur and of the humerus one can apply this mixed method in a large number of cases. By this means we can lessen and in a large measure do away with the inconveniences connected with the use of fixed apparatus, some form of which may be indispensable. In a number of cases the author has even practiced massage in compound fractures as soon as cicatrization of the wound was complete.

The secondary treatment of members in which luxations have taken place should also consist of massage and passive movements, which have not only proved of invaluable service in such cases, but have never in the author's experience exposed the patient in the slightest degree to the danger of a recurrence of the dislocation.

THE EXAMINATION OF SICK CHILDREN.

LANGFORD SYMES (Dublin *Jour. Med. and Science*, January, 1900) believes that as young children never know the seat, nature, or cause of disease, and the friends often mislead one through ignorance, and its discovery is therefore entirely dependent on the physician's physical examination, he should examine every organ, especially in hospital practice. Delay, roughness, and interruptions must be avoided. The examination must be made quickly. The child should be wrapped in a blanket or dressing gown only. As full a history as possible should be obtained as to the symptoms, previous illnesses, condition of birth, feeding, dentition, family history, hygienic conditions of the home. As to examination, the following order is recommended: —

1. *Facies.*— General appearance: Pale, florid, or jaundiced; fat or pinched and wasted; well developed or dwarfed. Attitude: If at ease, distorted, choreic, paralytic, or otherwise crippled. Sanity: Intelligence, state of cerebration. Conscious or comatose. Edema, cyanosis, skin affections, or eruptions are at once obivous. Respiration is visible. Physiognomy alone often reveals disease (chorea, pleuro-pneumonia, meningitis, adenoids, Bright's, wasting of diarrhea, atrophy or marasmus, inherited syphilis). The state of the ocular muscles and pupils is easily observed, and may reveal paralysis from cerebral abscess or tumor, thrombrosis of sinuses, tubercular meningitis, or diphtheritic paralysis.

2. *The Head.*— Pass the hands over it, to observe if there is sweating, as in rickets. Note the size and shape, whether microcephalic, hydrocephalic, rickety, or "natiform," with bosses or osteophytic nodes on the surface of the bones. The anterior fontanelle may be obliterated too early, or be widely open with resilient, attenuated edges, or tense and bulging; flat, or deeply sunken and depressed. Craniotabes may be felt. Measurement of the head is necessary in estimating mental capacity.

3. Pass the hands down from the head, and examine the entire frame,— bones, joints, shoulders, arms, hands, fingers, chest, ribs, hips, legs, and feet. Rickets, rheumatism with its subcutaneous nodules, torticollis, clubbed fingers, deformities, joint affections, and bone diseases, sarcoma, erythema nodosum, edema, chilblains, and pseudo-hypertrophic paralysis are thus at once observed.

4. The reflexes are commenced next: Plantar, ankle clonus, knee-jerks, cremasteric, abdominal, epigastric, facial irrita-

bility (for tetany), and ocular reflexes. Neuritis, chorea, diphtheritic paralysis, Friedreich's disease, meningitis, spatic paraplegia, birth palsies, and hemiplegia can frequently be differentiated thereby.

5. The eyes should be scrutinized for ocular paralysis, vision, photophobia, mystagmus, etc.; the ears for otorrhea, etc.; and the nose for snuffles, ichorous discharges, depressions, adenoids, etc.

6. *The Glands.*— Parotid, cervical and submaxillary, thymus and thyroid, supraclavicular, axillary and inguinal, showing perhaps mumps, Hodgkin's disease, tubercle, sarcoma or new growth, syphilis, glandular fever, or, with an atrophied thyroid myxedema or cretinism.

7. *Abdomen.*— Gentlest palpation will alone reveal its true condition. Observing the intestines, we look for abdominal tubercle, tubercular ulceration of the bowels, enlarged mesenteric glands, ascites, tumors, intussusception, constipation, or dilatation of colon. We measure the liver by finger breadths below the costal arch, and feel its edge. The spleen may often be felt and measured. The kidneys should be sought for, as they may be felt in some morbid conditions.

8. The heart should be examined; enlarged areas of cardiac dullness in children occur in chorea, pericarditis, diphtheritic paralyses, rheumatism, some cases of congenital heart disease, and whooping-cough.

9. *Lungs.*— Look for atelectasis or collapse, broncho-pneumonia and empyema, tubercular lobular pneumonia, and apex pneumonia. Now, as the child is sitting up, we glance next at the spine and test its curves, prominences, depressions, suppleness, or rigidity. We must distinguish rickety curvature of the spine from Pott's disease; and paralysis of the muscles of the back from diphtheritic paralyses, tumor of the cord, or anterior poliomelitis.

10. The neck reveals wasting. Rigidity may occur in tubercular or purulent or posterior basal meningitis, cerebellar tumor, enteric fever, diphtheria, apex pneumonia, tetany, retropharyngeal abscess, cervical caries, rheumatism, etc.

11. *Mouth.*— Lips, gums, teeth, tongue, cavity, palate, tonsils, and throat. We may find thrush, scurvy, stomatitis, and cancrum oris; delayed or irregular dentition from cretinism, rickets, or syphilis.

In the passage of the hands from the head twice up and down the body, the fullest information can be quickly gathered from examination of the various organs *en route*, while the hands are never taken off the child.

12. Special investigation of the nervous system must be conducted if any suspicion remains or if any nervous trouble is revealed. We should examine the motor phenomena, reflex, sensory, trophic, electrical, bladder, and rectum phenomena, mental capacity, speech, power of sitting, standing, walking, etc.

We can examine the urine, rectum, and anus and alvine discharges for worms, diarrhea, dysentery, prolapse, or syphilis. Blood estimation, the ophthalmoscope, weight, height, measurements, and psycho-physical instruments can all be used.— *Am. Jour. of Obst. and Diseases of Women and Children, March, 1900.*

SELF-MEDICATION.

Wm. B. Doherty, M. D. (New York *Lancet*, January, 1900), makes the following statements concerning self-medication, which are certainly worthy of careful study: —

"The habit of self-medication causes far more deaths every year in our community than did the carnage inflicted on both sides during our recent war with Spain. Our gambling propensities as a nation are shown in the worst light when we gamble on our lives. The digestive tract appears to be a slot machine, into which its possessor takes pleasure in thrusting any preparation with a euphonious name for the 'cure' of disease, suggested in newspapers, in circulars on our doorsteps, on posters on the dead walls of cities, in the street cars, on the fences along the line of travel, yea, on the mountain tops, to delude the healthy or the seeker of health from enjoying the advantages of such a salutary region. A morbid hysterical condition often results in many people from reading and studying flaming and picturesque notices regarding their nerves, livers, hearts, kidneys, etc. Laboring under the delusion of being ill, thousands will unnecessarily take drugs without consulting a physician (try their luck in 'cures' as they would in cards at the faro table), and become dyspeptics, neurasthenics, and inebriates in consequence.

Instead of obtaining the best remedies and advice from those qualified by education and experience to bestow them, people will pour drugs of which they know nothing into a body of which they know less, and will try, and keep on trying, their luck as long as the pleasing advertisements appear, to be changed only when a more alluring picture and catchy testimonial of a 'sure cure' presents itself;—4, 11, 44, you pay your money, and you take your choice,—a veritable lottery on life. The great lottery drawings of the world will give a list of the few big prizes that are won, but the names of the thousands and thousands who did not succeed in getting anything are not intended to be known by the emotional and foolish creatures who invest their money in such gambling schemes. And so it is with patent medicines. The multitude whose constitutions are really injured, or who received no benefit whatever from those nostrums, are never heard of. 'Foolery, sir, does walk about the orb like the sun; it shines everywhere.' How fortunate it would be for humanity if the tons of headache powders, the barrels of blood purifiers, and the hogsheads of liver pills were thrown into the sea rather than into the stomachs of people by men who scarcely know the name of a bone or a muscle or the function of a single organ of the body."

The Effect of Stimulating Various Portions of the Cortex Cerebri, Caudate Nucleus, and Dura Mater upon Blood Pressure.— W. H. Howell and M. F. Austin (*Am. Jour. of Physiol.*, March, 1900) give an account of a number of experiments made upon dogs in which various regions of the cortex cerebri, the caudate nucleus, and the dura mater were stimulated with induction currents, and the effect upon the blood pressure determined with regard to the cortex cerebri. It was shown that certain regions when stimulated give a definite vasomotor response, which may be either pressor or depressor in character. Most of the sigmoid region, anterior and posterior gyri, give a constant vasomotor effect. When the anesthetic used was morphia and ether, the effect was, as a rule, to cause a fall of blood pressure. With morphia and curare, however, the general result was an increase in blood pressure. The area from which these vasomotor effects were obtained most easily was the anterior sigmoid gyrus, corresponding to the neck area as given by Fritsch and Hitzig. Other areas from which similar results were obtained were in the coronal gyrus, the facial or eye region, and the extreme anterior portion of the prorean gyrus. As these areas all lie within the motor region, it seems possible that the motor innervation proceeding from them may be accompanied by a simultaneous effect upon the vasomotor center.

Stimulation of the portion of the caudate nucleus projecting into the lateral ventricle caused, under favorable conditions, a marked rise of blood pressure, together with an inhibition of the respiratory movements.

Most interesting vasomotor effects were obtained from stimulation of the dura mater. It was found that this membrane, particularly on its inner face, is very sensitive to mechanical stimulation, provided the ether anesthesia is not too deep. Pinching, cutting, or even gentle pressure with a moist sponge may cause a very marked change in blood pressure, together with greatly increased respiratory movements. When the animal was anesthetized with morphia and ether, the usual vasomotor effect was a fall in blood pressure. After the injection of curare, however, stimulation under the same conditions gave usually a rise in blood pressure. To gentle mechanical stimulation, at least, the dura seems more irritable than the other sensory membranes of the body.

The Early Diagnosis of Pulmonary Tuberculosis.— Ernst Levy and Hugo Bruns (*Deutsche med. Wochenschrift*, March 1 and 8, 1900) insist upon taking the entire amount of sputum for the twenty-four hours for examination, as the bacilli are not always present, and repeated examinations at not too long intervals must be made. In case of a negative result from sputum examination, resort should be had to animal inoculations. The authors also use the original tuberculin for diagnostic purposes, and believe that with care in its employment no harm can come from it.—*Medical Record.*

Cold Baths in Typhoid Fever.— M. F. Glénard (*Rev. Mens. des Mal. de l' Enf.*, January, 1900) reaches the following conclusions in regard to this treatment: —

Typhoid fever in childhood is an exceedingly grave disease; when treated by internal medication alone, the mortality is fifteen per cent. This rate falls to two and one-half per cent by systematic treatment with cold baths. It is about eleven per cent under mixed treatment, in which the cold bathing is merely a succedaneum of medication. With this mixed treatment typhoid fever is still a grave disease, and in cases of severe epidemics, or when the patient is under five years of age, the mortality is as high as in medical treatment alone. The prognosis is as uncertain, complications are as liable to occur, even in benign cases, the duration is as long, the convalescence as tedious, and the sequalæ often permanent. With systematic treatment by cold bathing, the rate of mortality remains very low, the prognosis is good from the beginning, the complications are reduced to a minimum, convalescence is short, and health is completely restored. Collapse has not been noticed in cases treated systematically in this way, any more than in pneumonia thus treated. Collapse is caused, not by too cold or too prolonged cold baths, but by too hot baths, or cold baths given at too advanced a stage of the disease, unaccompanied by medication addressed to the condition of the heart. Systematic cold bathing in typhoid fever has fulfilled all the hopes to which its adoption gave rise.— *The Am. Jour. of Obst. and Diseases of Women and Children, March, 1900.*

The Prevention of Tuberculosis.— Dr. S. Case Jones (*Journal of Tuberculosis*, January) concludes a paper as follows: —

For the proper restriction of bovine tuberculosis in a State or province we would recommend legislation under the following general divisions: —

1. Provide means by proper laws giving State or provincial boards of health the authority to investigate concerning the existence and cause of tuberculosis in cattle, and the danger to the public health therefrom, giving such boards the power to apply the tuberculin test to any animals in the State for the purpose of diagnosis, or of quarantining all tuberculous cattle, or causing their destruction.

2. Extend the powers of the State Board of Health to local boards of health, instructing them to pass local ordinances requiring that any milk or dairy products sold or offered for sale in any municipality shall be from herds that have been examined or tuberculin tested by a competent veterinary having authority from the State Board of Health, who shall certify that the herd supplying the milk or dairy product is free from all disease.

3. Make a law to prevent the importation into the State of any cattle for dairy or breeding purposes until they have passed the tuberculin test.

4. Require by law the slaughter, at a public abattoir, of all fat or beef cattle which are sold or used for food, and under competent State inspection, both ante- and post-mortem, putting a tag on each carcass, or quarter of carcass, setting forth the date of inspection and slaughter, the quality of meat, and the name and number of the licensed inspector, the said abattoir inspectors to be appointed and licensed by the State Board of Health.— *New York Medical Journal, March 24, 1900.*

Don't Worry.— "Don't worry" movements and circles are being formed all over the world, with the following "Rules for Conquering the Worry Habit: "—

1. Consider what must be involved in the truth that God is infinite, and that you are a part of his plan.

2. Memorize some of the Scripture promises, and recall them when the temptation to worry returns.

3. Cultivate a spirit of gratitude for daily mercies.

4. Realize worrying as an enemy which destroys your happiness.

5. Realize that it can be cured by persistent effort.

6. Attack it definitely, as something to be overcome.

7. Realize that it has never done and never can do the least good. It wastes vitality, and impairs the mental faculties.

8. Help and comfort your neighbor.

9. Forgive your enemies, and conquer your aversions.

10. Induce others to join the "don't worry" movement.—*Medical Herald.*

Observations on the Degeneration and Regeneration of Motor and Sensory Nerve Endings in Voluntary Muscle.— Huber (*Journal of Physiology*, Feb. 1, 1900), from his observation on the degeneration and regeneration of motor and sensory nerve endings in voluntary muscles, concludes as follows:—

1. The motor and sensory nerve endings of voluntary muscle degenerate after severance of the muscular nerves. The motor nerve endings and the extreme distal portion of the motor nerves degenerate earlier than do the sensory nerve endings.

2. The motor and sensory nerve endings in voluntary muscle may, under suitable conditions, regenerate completely. The motor nerve endings regenerate more quickly than the sensory nerve endings.

3. These experiments, it seems to me, show clearly that the regeneration of a degenerated portion of a peripheral nerve and its termination is brought about by the down growth of the axis cylinder of the central, undegenerated portion of the nerve fiber.

Further observations in this field are now in progress.

Non-operative Treatment of Appendicitis.— T. J. Shuell (*Transactions of Iowa State Medical Society*) uses the following method in the treatment of appendicitis: The colon is thoroughly flushed with very warm water every two or four hours during the stage of appendicular colic and the stage of hyperemia following thereafter, a period of from twenty-four to thirty-six hours. The flushing is best accomplished by means of a fountain syringe connected with a flexible rubber tube of about a number 20 catheter scale. The tube is passed up to the sigmoid flexure, or beyond it, and from two to three quarts of warm water is allowed to enter slowly by force of gravity.

Mr. Dwight L. Moody's View of the Medical Profession.— The *Medical Record* of Dec. 30, 1899, contains the following quotation from Mr. Moody:—

"Never yet, in all my years of work, have I called upon an able doctor, telling him of the sickness and need of some poor, friendless person, that he did not at once go to the rescue, without money and without price. Some of the noblest men I ever knew have gone out as medical missionaries, devoting their lives to doing good with the skill and healing medicines the Lord has conferred upon them.

"These are the men," he continued, "who are called devils by the faith healers," but he prayed God to forgive those guilty of such slander. "God heals," he said, "through doctors and through medicines. Do not be carried away through ravings of fanaticism. We have a new 'ism' in America about every year. Beware of the 'isms'!

"What should I do if I fell sick?— Get the best doctor in Chicago, trust to him, and trust to the Lord to work through him. The doctors have done wonders as their knowledge has grown; they have reduced the dangers of death from diseases that once slew all they touched; and the doctors, if God helps them, will yet find a way to stop the ravages of other terrors."

Alcoholism in Great Britain.— Dr. St. Clair Shodwell, speaking on the English Inebriates Act (*Medical Record*, 1898), says: "We find that in England in 1891 there were registered as dying from chronic alcoholism, 857 males and 643 females; from cirrhosis of the liver, males 2,289, females 1,552, giving a total of 5,896 deaths from alcoholism; nor have we in these figures included all the victims of inebriety, yet they show a larger number of deaths registered during the same year than from either enteric fever or diphtheria.

Uses of Formalin.—Ranelletti (*Suppl. al. Polyclin.*, Dec. 23, 1899) reports a case of moist gangrene of the leg due to popliteal embolism, which rapidly mummified and dried up under applications of a solution of formalin. Similar solutions of varying strengths were found useful in the palliative treatment of inoperable malignant ulcerating growths, more especially in uterine cancer.

"WHAT on earth are you doing with that little watering can, Freddy?"

"Sprinkling the baby's head so his hair 'll sprout."

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

BACTERIOLOGY OF BILE.

IN view of the increased frequency of surgical interference in biliary affections, Fraenkel and Krause (*Zeit. f. Hyg. u. Infectionskr.*, 1899, XXXII, s. 97) have endeavored to obtain more definite information as to the bacterial relations of human bile. With this object they have examined the contents of 130 gall bladders (128 post-mortem, 2 at operations), and further have tested the possibilities of bile as a nutrient substratum for pathogenic bacteria. In the first series of experiments the gall bladders were sterilized, opened, and the contents received into sterilized vessels. Glycerin-agar plates were immediately smeared with the bile, and incubated for twenty-four hours at 36° C. If they remained sterile, a second and even a third plate were similarly treated. In 15 cases anaerobic cultivation was also tried. Record of the color, clearness, reaction, and consistency of the bile was made. The reaction was generally neutral, in a few cases alkaline, never acid. The degree of turbidity of the fresh bile was no indication of its bacterial contents. Of the 130 cases examined, the bile proved to be sterile in 105, and to contain bacteria in 25. The cases included 35 of acute infective disease, 36 of tuberculosis, the remainder being composed of cases of malignant tumors, heart, kidney, lung, and brain disease. As regards the possibility of post-mortem bacterial invasion of the bile, no definite relation could be ascertained between the length of time which elapsed after death and before the examinations were made and the percentage of sterile and non-sterile specimens. Among the acute infective diseases, bacteria were cultivated in four cases only, a result which has led the authors to conclude that bile does not afford the medium in which specific bacteria are excreted from the system, except in those cases where the morbid process is essentially localized in the alimentary canal, as in cholera and typhoid. The bile in morbid conditions of the liver was examined in 23 cases; and in 7 cases of cirrhosis it proved to be sterile. In 16 of cholelithiasis, bacteria were found in 11 cases; namely, bacillus coli in 5, diplococcus lanceolatus in 1, streptococcus pyogenes in 2, a non-motile bacillus in the others. A large percentage of infected biles were further found in cases of peritonitis; in 7 cases of purulent inflammation, bacteria were found in 4, a pure culture of streptococci being obtained in 1. Among 8 cases of death after abdominal operation, the bile contained bacteria in 3; namely, streptococcus pyogenes 1, bacillus pyocyaneus 1, bacillus coli 1. Results of special interest were obtained from the 36 cases of tuberculosis; by cultivation 2 only were found to contain bacteria (bacillus coli and non-motile bacilli), but the intraperitoneal inoculation of guinea pigs with 11 of the specimens showed that 5 contained the virus of tuberculosis in an active form. These 5 cases in which the liver showed no microscopic tubercles (not examined microscopically) included 2 of miliary tuberculosis, 1 of caseous pneumonia, 1 of caseous peribronchitis, 1 of pulmonary and intestinal tuberculosis. The absence of intestinal lesions in all but one of these cases indicates that the tubercle bacilli must have come from the liver, and suggests a method of intestinal autoinfection other than that of swallowing infected sputum. In the second series of experiments, tubes of sterilized bile were inoculated each with a loop of a pathogenic bacterium inoculated at 36° C., and examined after twenty-four hours and on succeeding days by means of glycerin-agar plate cultures. By this method it was found that the bacillus typhosus, the bacillus coli, the bacillus pyocyanus, the vibrio choleræ, and staphylococci flourished well in their new medium, and remained alive for a considerable time. Other organisms, as streptococci, bacillus diphtheriæ, diplococcus lanceolatus, succumbed more or less rapidly. The authors experimented with the bacillus typhosus and the bacillus diphtheriæ, and found that cultures in bile, twenty-four and seventeen hours old, respectively, were more rapidly fatal to guinea pigs on intraperitoneal inoculation than bouillon cultures of a similar age. Pure sterile bile, alien or not, produced but slight changes on intraperitoneal inoculation.—*British Medical Journal.*

The Bacteria of Wounds Made under Aseptic Precautions.— Döderlein (*Munch. Med. Woch.*, June 27, 1899) thinks statistics as to the aseptic condition of wounds drawn from the fact of healing by first intention are valueless. He has made a number of experiments in cases of laparotomy by scraping the peritoneum and the wound before, during, and at the end of the operation, with a sterile platinum loop, and making cultures from it in Petri dishes, and has found that the number of colonies which develop are directly proportional to the length of the operation, and the amount of manipulation of the abdominal contents. In spite of the constant presence of bacteria, the operations ran a favorable course. The chief source of these organisms is the operator himself, as is proved by the failure of every device to prevent the bacteria in the air from entering the wound to make any great difference in the number of colonies.

Döderlein now believes that it is impossible to render the hands sterile. Even if the surface is made so temporarily, there is a constant desquamation of epithelium during the operation, which brings to light the uninjured organisms in the deeper layers. In this way he accounts for the great number of bacterial colonies obtained from originally sterile linen-thread operation gloves. The following experiment is another proof that these organisms come chiefly from the operator's hands: If at the operation thin rubber gloves are worn under the thread gloves, and cultures are made from the latter, very few colonies will develop. Luckily, the unavoidable contamination of wounds with non-pathogenic bacteria is of no importance, and the wearing of rubber gloves at operations is necessary only if the surgeon's hands have been in contact with septic matter, and there is danger of introducing pathogenic organisms.— *British Medical Journal, Feb. 10, 1900.*

The Presence of Bacteria in Butter and Other Milk Products.—Wessenfeld (*Berl. Klin. Woch.*, Nov. 27, 1899) reports an examination of butter for the presence of active tubercle bacilli, in the Bonn Hygienic Institute. The samples were taken from the markets and dairies in the neighborhood. The butter was centrifuged, and then injected into the peritoneum of guinea pigs. Of the thirty-two samples tested, twenty-two produced no change in the animals experimented upon. The twenty that died as a result of the injection showed post-mortem enlargement of the spleen and liver, and no evidence of peritonitis; cultures and preparations showed no organisms. Ten showed quite different results, peritonitis, and the presence of tubercle bacilli. The results of the experiments are thus summarized: Twenty cases showed no evidence of tuberculosis; ten cases showed tuberculosis, three of which were the so-called pseudo-tuberculosis, and seven true tuberculosis. There were further examined specimens of nutrose, eucasein, casein, plasma, or caseon. The latter contained the greatest amount of bacteria. It is evident, then, that these substances should not be regarded as indifferent when they are used as foods, on account of containing living bacteria in so great abundance.— *Medical Review.*

The Bacteriology of Impetigo.— Marie Davys (*Annales de Dermat. et de Syph.*, October), in a study of the bacteriology of impetigo, finds (1) that the micro-organism of the affection is a streptococcus having short chains; (2) that it is the only agent of infection, and that there is no microbic association; (3) that staphylococci are encountered in impetigo only as accidental inactive elements, or as the result of lesions accidentally ingrafted upon the original process, but quite distinct. The author does not seem to have determined whether this streptococcus is specific to impetigo.— *Medical Record, December 30, 1899.*

Bacillus Icteroides.—Bruschetti (*Centralbl. f. Bakt. Parasit. und Infektionskrank*, Dec. 23, 1899) describes some experiments on animals with the bacillus icteroides. In these he shows that the virulence of the microbe can be heightened by its passage through animals. He also states that in laboratory animals the infection with the bacillus icteroides represents a process so characteristic and so different from disease in the usual experimental types of disease of a bacterial nature that it lends itself excellently to the study of the problems with regard to immunity.

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HYDRIATIC MEASURES AS A MEANS OF CONTROLLING LOCAL BLOOD SUPPLY.

No really valuable therapeutic agent is so much neglected as that most versatile and potent of all remedial agents, common water. The chief value of water, aside from its property as a hygienic and nutritive agent, is as a means of cooling and heating the skin. The thermic impressions made give rise to numerous very profound physiological effects. Perhaps the most important of all these is the influence which by this means might be exercised over the blood supply of internal as well as external parts. The blood supply of any organ may be increased or diminished by any means which will increase or diminish the general movement of blood in the body. Cold applications raise arterial tension, increase the vigor of the heart, and accelerate the movement of the blood in the small vessels. The local supply of blood may be influenced to some degree positively by application to parts which are in direct relation with the affected part. There are two distinct anatomical arrangements through which this is accomplished: (1) The nervous connection, through the vasomotor centers, of every important internal organ with every distinct cutaneous area; (2) collateral venous and arterial relationships existing between the internal viscera and the surface of the body. The reflex areas referred to have been very carefully worked out by Winternitz, Beni-Barde, and numerous other investigators. A careful study of the anatomical relations existing between the surface circulation and the circulation of the internal parts shows very clear structural evidence for a positive and most marked control of the blood supply and movement in deep-seated parts. This is even true of the liver, stomach, kidneys, and lungs, as well as of the pelvic viscera and brain. When the blood supply of an internal organ is obtained from an artery, branches of which also supply the skin, the blood supply of the internal part may be easily influenced by increasing or diminishing the caliber of the external branches of the common vessel; in other words, when an artery has two legs, an external leg supplying the skin, and an internal leg supplying some internal viscus, it is only necessary to dilate the external leg by hot applications or other means to drain away a considerable amount of blood from the internal vessels. The movement of blood produced in these various ways is termed "fluxion."

By the term "fluxion" is meant the movement of blood. There are four modifications of blood movement to be considered:—

1. Increasing the rate of movement of blood through an organ.

2. Diminishing the rate of movement of blood through a part.

3. Increasing the volume of blood in a part containing too little blood (anemia).

4. Diminishing the volume of blood in a part containing too much blood (congestion, or hyperemia).

When a cold application is made to the whole surface of the body, all the internal organs are congested — after the first momentary contraction of their vessels has passed away — by the mechanical displacement of blood from the skin inward, or retrostasis. During the first instant after the general cold application, while the internal vessels are contracted, the surplus blood chased out of a systemic circulation finds temporary refuge, so to speak, in the veins and the portal

reservoir, from which in the later moments it is distributed among the internal organs. When the cold application is partial, however, this general retrostasis of blood does not occur except to a very limited extent, a very different readjustment of the blood distribution taking place. For example: If cold is applied to the lower part of the body, the blood vessels, both external and internal, contract, and the blood is driven out of the lower extremities, pelvis, and lower abdomen. At the same time the vessels of the head, chest, and arms are dilated, and the volume of blood in these parts is increased. The reverse is equally true. The umbilicus is the dividing line in this compensatory action. If cold is applied to one foot or hand, the effect is not, however, as might be supposed, to increase the volume of blood in the other hand or foot, but to decrease it, as was shown by Brown-Sequard, through reflex action. A cold compress or a percussion douche over the spine does not produce general internal congestion to any marked degree, but causes contraction of the spinal vessels, which by reaction is followed by active congestion if the application is short and intense, and so produces a powerful tonic effect through exciting the spinal centers.

By means of hot applications, effects the opposite of those following the cold are produced. The dilatation of the vessels of the legs following a hot application to these parts produces congestion of the vessels of the lower part of the body and anemia of the upper part.

By the application of this principle it is possible to combat either anemia or congestion of the brain, lungs, uterus, or other important vital parts. It should be said, however, that the principle is more often and more conveniently applicable to congestion and anemia of the upper part of the body than to similar conditions of the lower part, for the reason that intense congestion or anemia of the brain and lungs can not be induced with the same degree of safety with which we may congest the legs or lessen the blood supply of these parts.

Collateral Anemia and Hyperemia.—Where all the parts concerned are supplied by a common arterial trunk, a reciprocal change in the volume of blood occurs between the superficial parts. This relation exists between any muscle, joint, or bone and the overlying cutaneous area. It also exists between the overlying skin and the following organs: The brain, the spinal cord, the eyes, the ears, the serous lining of the pleural and peritoneal cavities, the lungs, the kidneys, the uterus and ovaries in woman, the testicles and prostate in man. This relation between the skin and the uterus, ovaries, kidneys, bladder, and lungs, is less intimate than between the muscles and joints, but clinical results as well as anatomical considerations indicate that a relation really does exist, though more remote, and it is even possible to trace a very distinct and direct anatomical connection between the blood vessels of the stomach, liver, intestines, spleen, and pancreas, and the contiguous superficial parts.

If in the illustration of this principle we apply a cold compress over a special part, as the front of the thigh, the result will be the production of pronounced anemia of the skin and a corresponding hyperemia of the underlying quadriceps extensor femoris muscle. If, on the other hand, a hot compress or a fomentation is applied instead, the result will be the diversion of blood through the skin and the production of anemia of the muscle.

It is by the application of this principle that we are able to combat inflammation, congestion, and pain in muscles and other deep parts which are directly connected with the skin through a common blood supply. By diverting blood to the skin by means of a fomentation or other hot application, the congested or

inflamed muscle, nerve, or joint may be relieved. The same rationale explains the relief of local pain in pleurisy, pneumonia, cephalalgia, otitis media, peritonitis, enteralgia, renal, hepatic, and intestinal colic, ovaritis, and other visceral pains.

In not a few instances the collaterally related parts are not continuous. The relation of the blood vessels rather than the simple contiguity of the parts should be considered. Many examples of this might be given: The cutaneous vessels of the arm are collaterally related with the brain circulation through the vertebral branches of the subclavian, through the lung with the superior intercostals, the legs and hips with the head, by diverting blood into the abdominal aorta and its branches; the legs with the pelvic viscera, by diverting blood into the external branches of the common iliac; the portal circulation in the lungs and brain, by withdrawing blood from the general circulation.

The most powerful effects possible are obtained by measures which combine the principle of induced hyperemia of collaterally related parts with that of reflex stimulation of the controlling vasomotor centers. Fortunately, the cutaneous areas which may be utilized for these respective purposes are often distinct, so that there is no anatomical obstacle in the way of their simultaneous employment.

Venous or passive hyperemia may likewise be induced as a means of draining collateral vascular areas. The means to be employed are the fomentation at a moderate temperature (104° to 110°), and the protected heating compress applied without change until the desired effect has been obtained. Venous congestion is usually produced in connection with the arterial hyperemia resulting from a hot application. It may be induced independently, and if desirable, simultaneously with arterial hyperemia, by operating upon distinct and even widely removed areas.

By means of induced collateral arterial hyperemia, the arteries of a part are drained, the blood supply is lessened, and tension lowered. By induced venous hyperemia the veins of the part interested are drained, and the movement of blood through the part is accelerated by lessening resistance. An inflamed part does not need less blood, but less tension, and especially the rapid removal of toxins, CO_2, and disabled leucocytes, and an abundant and constant supply of fresh and pure serum, oxygen, and active leucocytes.

In active visceral congestion, collateral arterial hyperemia is especially indicated, as in the first stage of an inflammation. In passive hyperemia, venous hyperemia is especially helpful, but certainly the best effects will be obtained by the simultaneous application of these two most efficient procedures.

Induced venous hyperemia may render most valuable service in many cases by association with cold compresses applied to another cutaneous area which is reflexly associated with the internal organ under consideration. The cold compress contracts the artery, while the fomentation or other hot application drains the veins.

What other agent is known to man which is so capable of positively and instantaneously controlling the local blood supply?

In our next issue we will briefly consider some of the effects which may be produced by the different forms of the compress.

RATIONAL TREATMENT OF OBESITY.

IN *Therap. Monat.*, February, 1900, Kisch takes strong ground against the drug treatment of obesity. He holds that vinegar does not increase the oxidation of fat, but simply produces cachexia from chronic acetic acid poisoning. He holds the same view with reference to the

use of iodine and iodides. Pilocarpin is held to be objectionable because of its depressing effect upon the heart, which is very likely to be weak from fatty infiltration or degeneration, and otherwise hampered in its work. Purgatives are condemned because of the malnutrition induced by irritation of the intestinal mucous membrane.

The rational treatment of obesity is to be found in the limitation of food to the patient's actual needs, short, hot sweating baths followed by vigorous cold applications, especially the half bath, wet-sheet rubbing, and the wet-sheet pack, and subsequent exercise. The exercise should be taken after the cold bath, for the reason that it is undesirable in the majority of cases of obesity to increase oxidation of proteids by elevation of temperature, whether by the hot bath or by exercise, when the latter is done in such a way as to induce elevation of body temperature. Exercise, when sufficiently prolonged and vigorous to elevate the body temperature, by the increased movement of blood and increased absorption of oxygen, is especially likely to produce excessive oxidation of proteids. This is very likely to occur in obese patients, because of the difficulty in eliminating heat through the enormous layer of non-conducting fat with which the body is covered. Hence exercise should be preceded by the cold bath, which makes room for the elevation of temperature by lowering the temperature of the blood a few tenths of a degree. The baths best for this purpose are somewhat prolonged cold applications, such as the rubbing shallow bath for three to five minutes, the immersion bath with friction, and the cold pack. A short hot bath preceding the cold bath not only prepares the patient to receive the cold bath without discomfort, but increases the effect of the latter by dilating the surface vessels, thus bringing a larger quantity of blood under the influence of the water, the temperature of which should be 75° to 65° F.

RHEUMATISM AND A FLESH DIET.

In a discussion of the nature of rheumatism and rational methods of treatment, which occurred before the Society of the Alumni of Bellevue Hospital, Nov. 1, 1899, the President, Dr. Chas. E. Quimby, expressed himself as having been for many years convinced that flesh foods are a cause of rheumatism. He mentioned a case treated some ten years before, in which the patient had suffered from frequent attacks of rheumatism and from a cardiac angina. All the routine methods had been employed, but without result. He found that this patient had observed a connection between rheumatism and indigestion following the use of flesh foods, from which he drew the conclusion that the poisonous elements upon which the disease depended were derived from the flesh; from which he infers, also, that changes in the muscular structures of the body might give rise to the production of toxic substances which might produce the disease. Such a condition would of course be aggravated by the use of flesh food, and the absorption into the stomach of the toxins always contained in flesh. He ordered the total exclusion of meat from the dietary of the patient referred to, and with the result that both the rheumatism and the angina ceased at once. For over two years this patient abstained wholly from flesh food, and had been entirely free from rheumatism.

These observations of Dr. Quimby are of great practical interest, and indicate a clear conception of the relation between chronic disease and disturbed metabolism.

Massage in Exophthalmic Goiter. — According to the *Medical News*, Zabludowski, of Berlin, has secured excellent results in the treatment of exophthalmic goiter by massage, especially in cases in which the gland is soft and pulsating. The gland is kneaded, one side at a time,

by the usual method of pit massage, or deep kneading. The heart movement is slowed by percussion of the spine in the dorsal region. Nerve pressure and vibration are practiced upon the pneumogastric in the neck and the sympathetic, also upon the occipital, cervical, and intercostal at points where these are accessible from the surface. General passive movements or manual Swedish movements are also employed.

Epilepsy Produced by Coffee.— Dr. O. Marburg (*Centralblatt für In. Med.*, March 17, 1900) calls attention to a case of epilepsy in a woman aged forty-four years, who had used coffee freely, eating the roasted coffee beans to the extent of an ounce a day, for thirty or forty years. He believes the epilepsy to be due to the use of the coffee, a conclusion which seems very reasonable. Coffee and tea are without doubt responsible for a considerable number of nervous disorders which are rarely attributed to the right cause, but are perhaps regarded as idiopathic, or due to remote influences which have been in fact little responsible for the development.

Oyster Infection.— The *British Medical Journal* in a recent number again calls attention to the dangers involved in the use of those "delicious mollusks," the oyster and the clam, due to infection of these bivalves by sewage. The oyster lives upon diatoms (bacteria obtained from the slime covering the sea bottom and the stems of seaweeds). Typhoid fever germs have been found both in the oyster juice and in the stomach and other portions of the body of the oyster. Many epidemics of typhoid fever have been traced to the use of infected oysters. It would seem much safer and wiser to leave the oyster to attend to its business as a scavenger of the sea, instead of terminating its usefulness by swallowing it, alive and kicking, germs and all.

Operation for Appendicitis without Removal of the Appendix.— Gilbert Barling, in the December (1899) number of the *Edinburgh Medical Journal*, presents interesting statistics of operation in 117 cases of appendicitis, 42 of which were operated upon in a quiet interval, all but one recovering. In all these cases the appendix was removed. In 49 other cases operated upon while in the suppurative or inflammatory state, the appendix was removed in only 10 cases, or one fifth the entire number. Death occurred in four of these cases. Although the appendix was left in a large proportion of the cases,— certainly a wise procedure,— there was but one recurrence subsequent to operation.

Hydrotherapy in Typhoid Fever.— Dr. Frank Billings, in a recent article in the *Journal of the American Medical Association*, takes strong ground in favor of hydrotherapy as the most rational and efficient method of treatment in typhoid fever. In the same journal Dr. Wm. E. Quine admits that the Brand method of treatment reduces the mortality of typhoid fever six to seven per cent.

Tuberculosis in Dublin.— Statistics recently published by Charles A. Cameron, the well-known medical officer for Dublin, show the annual death-rate from tuberculosis in Dublin to be 34 to 10,000, or perhaps one fifth the total mortality. The frequency of this grave disease is unquestionably increasing, a fact which points to general race deterioration.

THE EDUCATION OF INVALIDS.

We are glad to note that the Chicago Board of Education is at the present time considering the establishment of a school for cripples and other invalids who are mentally capable but physically incapac-

itated for receiving an education in the common public schools. If this project can be carried out, and there is no reason to doubt that it can, it is certainly one in the right direction. The necessity of such a school is apparent to every one who is at all familiar with the large numbers of such children in our large cities.

Many children who are crippled are especially bright mentally, and could they receive good education, would fill a useful place in society, and thus be self-sustaining instead of being subjects of charity.

The Board has already fitted up a room in one of the schools near the Home for Crippled Children. It is the intention of the Board to establish a separate school for these unfortunate but worthy individuals.

This example of the Chicago Board is worthy of imitation, and we hope that the day is not far distant when these unfortunate children, wherever found, will have the advantage of our splendid system of education. C. E. S.

REVIEWS.

ANNUAL AND ANALYTICAL CYCLOPEDIA OF PRACTICAL MEDICINE. — By Charles E. de Sajous, M. D., and one hundred associate editors, assisted by corresponding editors, collaborators, and correspondents. Illustrated with chromo-lithographs, engravings, and maps. Vol. V. Philadelphia, New York, and Chicago. The F. A. Davis Company, publishers. 1900. Price, cloth, $5.00; half Russia, $6.00.

This volume of 662 pages contains the most recent and reliable information upon some of the most important subjects in medical practice. Among the topics treated are "Nursing and Artificial Feeding," by Drs. L. Emmett Holt and L. E. La Fetra; "Disorders of Pregnancy," by Dr. Currier; "Abnormal Parturition," by Drs. Grandin and Marx; "Pleurisy," by Dr. Alexander McPherdan; "Catarrhal Pneumonia," by Dr. Solomon Solis-Cohn; and "Lobar Pneumonia," by Dr. Thomas G. Ashton.

We know of no work which we can more heartily recommend to the profession with the assurance that they will obtain the most recent and reliable information on the topics treated. In this volume we find grouped together in a very skillful manner such facts as are most essential to the practitioner. The workmanship of the book is all that can be desired. This series of books forms a most valuable addition to the physician's library.

DISEASES OF THE NOSE AND THROAT.— By J. Price-Brown, M. B., L. R. C. P. E., Member of the College of Physicians and Surgeons of Ontario; Laryngologist to the Toronto Western Hospital; Laryngologist to the Protestant Orphans' Home; Fellow of the American Laryngological, Rhinological, and Otological Society; Member of the British Medical Association, the Pan-American Medical Congress, the Canadian Medical Association, the Ontario Medical Association, etc., etc. Illustrated with 159 engravings, including 6 full-page color-plates and 9 color-cuts in the text, many of them original. 6¼ x 9¼ inches. Pages xvi–470. Extra cloth, $3.50, net. The F. A. Davis Co., Publishers, 1914–1916 Cherry St., Philadelphia.

The author, who has spent nearly a score of years in general practice, and who for the last ten years has been engaged in the special line of which this work treats, has in this volume given to the profession the results of his extensive experience.

A careful perusal of the work reveals it to be one of value. The work is well illustrated, and the workmanship is all that can be desired.

THE INTERNATIONAL MEDICAL ANNUAL AND PRACTITIONER'S INDEX.—A work of reference for medical practitioners. Eighteenth year. E. B. Treat & Co., 241–243 West 23d Street, New York; 199 Clark Street, Chicago. 1900. Price, $3.00.

The present volume, like its predecessors, contains an excellent résumé of the most recent valuable medical literature. The work is so arranged that it is especially adapted for ready reference. The busy practitioner who has not the opportunity to read the great mass of medical literature will find in this work the pith of the most recent ideas advanced in the medical sciences. The book is well worth the price, and will form a valuable addition to the physician's library. The work is well illustrated, and the workmanship is good.

A REVIEW OF THE HISTORY AND LITERATURE OF APPENDICITIS.— By George M. Edebohls, A. M., M. D., New York. Reprint from the *Medical Record*, Nov. 25, 1899. The Publishers' Printing Co., 32 and 34 Lafayette Place, New York, 1899.

A perusal of this reprint of forty-six pages reveals it to be one of more than ordinary value. The author has by his painstaking efforts given to the medical profession in this condensed form much valuable information concerning the history and literature of appendicitis. That the literature on

the subject of appendicitis is voluminous is evidenced by the fact that up to and including the year 1898, more than twenty-five hundred journal articles, dissertations, and books (all but a very small fractional part of which the author has consulted in the original in the production of this paper) have appeared on the subject.

The reprint contains also an extensive bibliography, which of itself is of great value to any one wishing to refer to the literature on the subject of appendicitis.

"The Personnel of the Ecumenical Conference" forms the subject of a timely and important article in the April number of the *Missionary Review of the World*. The writer, Dr. Judson Smith, briefly describes some of the leading guests and speakers who are expected to stir New York during the last ten days of April by their thrilling missionary addresses. Portraits of many speakers accompany the article. Another important paper is by Prof. Gustavus Warneck, D. D., one of the leading authorities on missions in the world, who writes on "Protestant Missions at the Junction of Two Centuries," and describes the situation of 1800 and 1900, and the progress during the hundred years. "Missionary Quickenings of the Century," by Dr. Arthur T. Pierson, is filled with facts and incidents describing the Pentecosts on foreign mission fields. An important article on "India as a Mission Field," by Rev. Edward Storrow, formerly of Calcutta, furnishes valuable information on the subject of the rise, growth, and present aspects of missions in the Queen's Empire. Other articles which deserve attention are, "Porto Rico under the United States;" "How Some Things Go in Korea;" "The Outlook in Japan;" "Missions and Governments;" "Problems of Hinduism;" etc.

Published monthly by Funk & Wagnalls Co., 30 Lafayette Place, New York. $2 50 a year.

PAMPHLETS RECEIVED. — "Stricture of the Esophagus and Electrolysis by a New Esophageal Electrode." Charles D. Aaron, M. D., Detroit.

"Presidential Address before the American Laryngological and Otological Society, 1899;" "Sputum Analysis and the Early Diagnosis of Pulmonary Tuberculosis." S. Edwin Solly, M. D., Colorado Springs.

"The Justo-Major Pelvis as a Factor in the Causation of Perineal Injuries." Joseph Brown Cooke, M. D., New York.

"Goiter." Frederick C. Shaefer, M. D., Chicago.

The Battle Creek Sanitarium

LABORATORY OF HYGIENE.

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F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, M. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR MARCH.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
103 per cent.	2		2
100 " "	78	22	100
98 " "	32	21	53
95 " "			
93 " "	15	16	31
91 " "	1	2	3
88 " "	3	8	11
85 " "	4	3	7
83 " "	4	1	5
78 " "	1	7	8
71 " "		8	8
Below 70	1		1
Total	141	88	229

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	57	15	72
Between 4,500,000 and 5,000,000	46	21	67
" 4,000,000 " 4,500,000	18	26	44
" 3,500,000 " 4,000,000	8	10	18
" 3,000,000 " 3,500,000	4	5	9
" 2,500,000 " 3,000,000	4	5	9
Below 2,500,000	4	6	10
Total	141	88	229

Examination of Sputum.— There were 32 examinations made, 27 being new cases. Tubercle bacilli were found in 5 cases.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	39	78	9	82	29	45	77	62
Less than 10,000 bac	10	20	2	18	15	23	27	21
Between 10,000 and 100,000 bac	1	2			6	10	7	6
More than 100,000 bac.					14	22	14	11
Total	50	100	11	100	64	100	125	100

The patients were received from the following States and countries: Michigan, 27; Illinois, 18; Ohio, 15; Indiana, 12; New York, 6; Wisconsin, 8; Kansas, 3; Missouri, 3; Iowa, 3; Tennessee, 3; Montana, 3; Texas, 2; Kentucky, 2; South Dakota, 2; Minnesota, 2; Massachusetts, 2; North Dakota, 1; Mississippi, 1; Nebraska, 1; Arkansas, 1; Colorado, 1; Connecticut, 1; Vermont, 1; Indian Territory, 1; Canada, 1; England, 1; British Columbia, 1; unclassified, 3. Total, 125.

Urinary Laboratory.— Total number of specimens examined, 572; number of new cases, 212; number of cases having albumin, 15; casts, 13; sugar, 7; pus, 112; blood, 4; bile, 2.

Medical Dental Pharmacal BOOKS

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PUBLISHERS' DEPARTMENT.

THE Calhoun County Medical Society recently passed the following resolutions: —

"WHEREAS: We, the members of the Calhoun County Medical Society, believing that the management of the hospitals of the University of Michigan, as carried on by the Board of Regents, is not to the best interests of the physicians or of the worthy poor of the State; and —

"WHEREAS: We believe that change for the better may be made without in the least deterring from the valuable work now being done at the hospitals both for the patients and students; and —

"WHEREAS: We, the physicians of this Society, feel that great injustice is being done both to the physicians and the worthy poor of this State, which injustice may and will be remedied when the attention of the regents shall be called to it; and —

"WHEREAS: We believe that the physicians of the State are in part to blame for the condition that prevails in referring to the University hospitals patients who are able to have competent attendance and pay a reasonable fee therefor nearer home; therefore be it —

"*Resolved:* That we as a Society condemn the practice of any physician in referring or advising to the University hospitals any patient who is able to pay a reasonable fee, and who can receive competent attendance nearer home; and be it further —

"*Resolved:* That we respectfully call the attention of the Honorable Board of Regents to the following facts and arguments in the support of our claim, and earnestly request that such change may be made as will do credit to themselves and justice to all concerned: —

"I. The medical department of the University of Michigan is intended primarily to be the means of educating in the best manner possible those students who wish to study medicine and surgery.

"II. It is not justice to educate physicians, and then enter into competition with them in their efforts to maintain a livelihood, by taking as patients such people as are able to pay a reasonable fee and can obtain competent attendants at home, thus compelling physicians of the State to regulate their fees in private practice to the minimum expenses of patients at the University hospitals; neither is it justice to the physicians, as citizens, to tax them for the support of an institution which deprives them of their only means of an income.

"III. In the crowded condition of the hospitals it is not necessary, for the benefit of the students, to extend the clinical advantages of the former to such people as are able to pay reasonable fees, on the same terms as the worthy poor. Moreover, it has a demoralizing, pauperizing effect on a community to give free attendance to well-to-do people.

"IV. It is an injustice to the poor, who need immediate attention, to be compelled to wait until room can be made for them in the hospitals, such rooms often being occupied by others who could well pay for attention outside.

"*Resolved:* That the Secretary of this Society be instructed to call the attention of the different medical societies of this State to this resolution, with our request that they indorse it, or pass similar resolutions; and to cause a copy of it to be sent to the different medical journals for publication, and also to forward a copy to the Board of Regents."

MODERN MEDICINE

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ORIGINAL ARTICLES.

HYDRIATIC INSTITUTIONS AND THEIR EQUIPMENT, AND THE GENERAL MANAGEMENT OF CASES.[1]

BY J. H. KELLOGG, M. D.,

Superintendent of the Battle Creek (Mich.) Sanitarium.

(Concluded.)

THE hydriatrist should always be sharply on the lookout for untoward effects from the applications which the patient is receiving at his hands, and should be ready to apply at once the necessary remedy, whether in the form of a hydriatic antidote or such an adjustment of the prescription as will obviate these untoward effects, which may be briefly enumerated, with a few words of suggestion, as follows: —

Loss of Flesh.— If the patient's weight is normal, as indicated by the height-weight coefficient [the height-weight coefficient of the average man is 37; that is, he weighs 37 kilograms (1¼ oz.) for each millimeter (one twenty-fifth of an inch) of height, as the author has elsewhere pointed out],[2] a loss of flesh probably indicates overtreatment or advance of the disease. There are many cases, however, in which metabolism has been so sluggish, allowing an accumulation of imperfectly oxidized waste matters in the body, that the first effect of active stimulation of the nutritive processes is disproportionately to increase destructive metabolism. Under these circumstances there is necessarily a slight decrease in the weight. The rubbish must be removed, and old, defective structures broken down before new and more highly organized tissues can be deposited. It is hence apparent that a slight loss of weight need not give rise to any apprehension; but if this loss is considerable, or continues for some time, especially if accompanied by a loss of strength or appetite, it is a matter requiring immediate attention, and there should be a readjustment of the patient's prescription.

As Bouchard has so clearly pointed out, a great number of chronic invalids are suffering from a slowed or enfeebled condition of the general nutrition, where there is deficient metabolism, either constructive or destructive. There are, of course, morbid conditions in which metabolism is accelerated. Hydrotherapy affords more effective means than any other known agent for the control of these tissue changes, as has been clearly shown in the chapters devoted to the physiological effects of water; but it is of course necessary that they should be intelligently applied, so that the loss will not be so rapid as to discourage the patient or reduce his strength unduly.

A very common cause of the loss of flesh referred to is the excessive employment of heating measures. When this is the case, these should be at once suspended, and short cold applications at 60° to 65°, duration four to ten seconds, or as cold as the patient can bear, should be substituted. Long cold applications should be avoided. In some cases very vigorous cold procedures can not be tolerated, and only very mild tonic measures, such as cold friction, should be employed alone or alternated with neutral baths.

A gain in flesh is to be effected by means of neutral temperatures, as by neutral baths, the neutral pack, or the rain douche, combined with wholesome food and plenty of rest. In many such cases it is necessary to employ hydriatic measures in such a way as to produce activity of internal parts, as in hypopepsia with anorexia and emaciation. The increased movement of blood and diminished outflow of energy resulting from the application of sedative measures, with just sufficient stimulation by cold friction or wet sheet rubbing to maintain active nutrition, are effects which may be

1 From the forthcoming work, "Rational Hydrotherapy."

2 "A New Dynamometer for Use in Anthropometry," read before the American Association for the Advancement of Physical Culture, 1893.

advantageously employed in cases in which loss of flesh is to be combated. When pain or irritability exists, higher temperatures are required.

On the other hand, the failure of an overfat patient to decrease in flesh indicates the need of more vigorous procedures. Obesity may be best combated by the application of measures which will produce powerful stimulation of the nerve centers. The wet-sheet pack, vapor bath, or electric-light bath not too greatly prolonged, followed by the cold bath, cold shower bath, with affusions to the abdomen, constitute a rational treatment for persons who have been properly trained to the employment of such powerful measures.

Loss of Appetite. — The loss of appetite in hydriatic treatment is a matter requiring immediate attention, as the usual effect of the treatment is to increase appetite at once. As a rule, short very cold applications made when the patient is fasting, powerfully stimulate the appetite. A cold bag applied over the stomach half an hour before meals is highly useful for this purpose.

Loss of Strength. — This, like loss of appetite, is a symptom which is indirectly of great significance, and one which should receive attention without delay. Tonic hydriatic procedures energize in a wonderful way both the nerve centers and the muscular system. Gradual loss of strength indicates the necessity for more highly tonic applications; or if the patient is feeble, it may be possible that the applications are too vigorous, so that the patient's energies are overtaxed by the strong reaction induced. The employment of the author's universal dynamometer[1] in connection with hydriatic treatment furnishes a ready means for determining the constitutional effects of the measures employed. A study of the coefficients which may be obtained by the use of this instrument instantly furnishes a clue to the patient's vital condition, and affords a means by which any change, whether favorable or unfavorable, may be at once observed. The height-weight, strength-weight, strength-height, and respiratory-height and -weight coefficients are especially valuable.

The bloodcount and the percentage of hemoglobin may be watched with great profit. A diminution indicates that excessive demands are being made upon the system in the stimulation of eliminative and oxidizing processes. The appearance of an excessive amount of uric acid or urates in the urine, while generally accompanied by unpleasant symptoms, such as headache, malaise, etc., is not necessarily a discouraging feature, though it is a symptom the significance of which the patient will often need to have explained. In cases in which this symptom appears there has been for a long time an accumulation or storing-up of uric acid in the tissues. The increased alkalinity of the blood resulting from tonic and alterative hydriatic procedures renders possible the solution and elimination of this toxic element, the product of the deficient oxidation of nitrogenous wastes, which accounts for the sedimentary deposits referred to. This symptom should be welcomed as an indication that the treatment employed is accomplishing the results expected of it; and no matter how depressed in mind the patient is, he may be assured that he is making real progress toward recovery.

The appearance of *an excessive amount of urea or a trace of albumin or sugar* may be an indication that the procedures employed are too intense. The temperature should be elevated and the pressure reduced. The possibility of the appearance of these symptoms should lead to a frequent examination of the urinary secretions. Such an examination should be made at least once a week.

An excessively active destructive metabolism may be at once suspected from the presence of an excess of chlorides, while an excess of phosphates indicates great excitation of the nervous system. In such cases the intensity of the treatment must be diminished, applications at a more neutral temperature being employed. Excessive nitrogenous waste usually results from too prolonged hot baths, leading to abnormal destruction of the proteid tissue elements. Such a waste is usually attended by a loss of nervous and muscular energy.

Palpitation of the heart indicates that the application has been at too extreme a temperature, — too hot or too cold, — or that it has been managed in such a way as to produce an improper excitation of the heart. When this symptom is troublesome, more moderate temperatures

[1] "Physical Coefficients," Modern Medicine Pub. Co., Battle Creek, Mich.

should be employed, and with less pressure, and in making the application care should be taken to avoid the region of the heart and chest. In some instances, this unpleasant symptom may be entirely avoided by the application of a cold compress or an ice-bag over the heart during the procedure. The application of the Scotch douche to the legs at the beginning of a general cold application, by dilating the blood vessels of the lower extremities, aids in lessening the tendency to palpitation of the heart, as does also the application of cold water to the head and chest, especially the precordial region, previously to the general application of the douche.

Dyspnea rarely occurs except in persons suffering from emphysema, or who are subject to attacks of nervous asthma. The indication is either that the application made is too intense, or that sufficient care has not been taken to avoid the region of the chest, especially the front part of it. More moderate applications or the employment of a somewhat prolonged (ten to fifteen seconds) cold douche (65° to 70°), with low pressure, before the general application, will generally suppress this symptom; or it may be relieved by a neutral compress to the chest and a Scotch douche to the legs.

Malaise, *nervousness*, and *depression* are symptoms commonly resulting from overtreatment or excessive employment of heating procedures. The last-mentioned cause is most frequent. Depression and malaise may generally be quickly overcome by vigorous general cold applications or the cold dorsal percussion douche daily. The Scotch douche to the back or the prolonged neutral affusion to the spine (93° to 96°, ten minutes) relieves nervousness and other symptoms of excitation.

Vertigo and *fainting* are symptoms likely to occur in connection with hot applications when too greatly prolonged, but are quickly relieved by cold applications, especially cold affusion to the chest and shoulders. Their recurrence indicates the necessity for a change in the prescription by lowering the temperature or by increasing the pressure of the bath.

Sleeplessness may result from excessive stimulation by intense cold procedures or by the excitement arising from heating processes. When these procedures are necessary in persons subject to sleeplessness, they should be administered in the early part of the day instead of the evening, and if necessary, the neutral bath may be employed at bedtime to counteract any excitation which may remain from the treatment in the early part of the day. If the difficulty is not thus controlled, the exciting measures may be suspended for a time, such quieting means as the tonic pack, the neutral immersion bath, the neutral douche, or cold friction being employed instead of the douche or the shallow bath.

Pain may be the result of excessive congestion of some part, induced by misapplied or mismanaged procedures, or it may be simply the awakening of some chronic neuralgic affection. The cold douche often gives rise to sciatic or intercostal pains in persons who have been subject to those difficulties. Pain is very likely to result from cold applications which have not been followed by complete and thorough reaction.

Headache is one of the most common results of mismanaged or too intense hydriatic procedures. "The hydropathic headache" is a well-known phrase among the frequenters of Continental hydropathic institutions. Headache is very likely to result from excessively cold or excessively hot procedures, and may be due either to congestion from imperfect regulation of the circulation, or to excessive excitation of the cerebrum.

Deficient reaction, as shown by long-continued pallor and coldness of the skin, with chilliness, cold extremities, and generally headache, indicates that the duration of the application has been excessive, or that the patient was not properly prepared for the application. The last-named cause is perhaps the most frequent. The patient who is chilly or exhausted when the cold application is made, is likely to suffer in this way. Deficient reaction not infrequently occurs as the result of neglect to employ, after the bath, the proper measures to encourage reaction, the most important of which are rubbing and exercise. Exercise is by far the best means of encouraging reaction, as it sets in operation most fully the forces necessary for perfectly balancing the circulation, increasing heat production, and energizing all the vital functions.

Very short and very cold applications are most likely to be followed by complete

and thorough reaction. Reaction is quite certain to fail, especially in feeble patients, when a succession of cold applications is made with an interval between, as, for example, a rubbing wet sheet followed by a prolonged cold sitz bath, or the sitz bath followed by a cold douche. A patient not possessed of very vigorous reactive powers would be almost certain to suffer the evil results of defective reaction following secondary chill, if subjected to such a formula as the above. The author has known many similar and worse combinations to be employed, and yet wonderment was expressed that the results were not such as had been expected.

When the patient fails to react during or after a cold application, as the wet-sheet pack, the shallow bath, the wet-sheet rubbing, or the cold douche, a hot application should be made at once, the temperature of which should be about 100° F. at the beginning, being rapidly raised until a temperature as high as the patient can endure is reached — 108° to 110°. When the patient has become so thoroughly heated that he longs for some cooling drops to fall upon him (one to three minutes), the cold application should be renewed; but unless he has been accustomed to the use of cold applications, the temperature should not be lower than 65° to 75°, and the duration should be brief. If a douche apparatus is not convenient, the patient may be put into a hot immersion bath at 100°, the temperature being afterward raised to 106° or 108°, until he is thoroughly warmed, as indicated by flushing of the face and a full pulse. The cold affusion (70° to 80°) may then be employed while the patient sits or stands in a partially filled tub. The patient should not be allowed to leave the hands of the attendant until good reaction has been produced and the circulation has become well balanced, as shown by a full, steady pulse.

Excessive reaction, as shown by over-excitation of the heart, perspiration, and prolonged sensation of heat, fullness of the head, perhaps headache, indicates a too intense or too short application. In the employment of the Scotch douche the symptoms named are very likely to occur when the cold application is not employed for a sufficient length of time to allay the exciting effects of the heat, and develop the tonic-sedative influence of cold. Excessive reaction calls for a reapplication of cold at moderate temperature (65° to 80°), with little pressure.

Eruptions of the skin indicate excessive cutaneous excitation, and interdict the use of the sweating pack and similar procedures. In some instances the vapor bath or the electric-light bath must be substituted for more exciting sweating procedures, or the prolonged neutral bath, followed by cold affusion, must be employed instead of more highly tonic applications, until the irritated condition of the skin is relieved. Cold friction, the rubbing wet sheet, the hot immersion bath, and similar processes must of course be avoided in cases of this kind.

Winternitz has made the interesting discovery that hydrotherapy may be employed as a sort of diagnostic "reagent" to determine, in doubtful cases, whether or not syphilitic infection exists. In persons in whom this dyscrasia is present, the characteristic eruptions occur under hydriatic treatment, especially from the stimulating effect of the sweating pack and other sweating processes and cold shower baths.

The occurrence of *spasm* of the *voluntary or involuntary muscles* is a symptom that may require special attention. Cramps in the muscles of the legs sometimes occur in the prolonged cold bath administered for antifebrile effects in continued fevers. This may be obviated by rubbing the parts with cold water before the bath, or by wrapping the legs with flannels wrung out of very cold water just before the patient enters the bath. Special attention should be given to rubbing the legs in the Brand bath and the shallow bath to prevent the occurrence of this unpleasant symptom in persons especially subject to muscular cramps, in whom this symptom is very likely to occur whenever cold water is entered, or even water at a temperature of 70° to 75°, thus rendering swimming dangerous. In such cases the limbs must be rubbed vigorously and continuously during cold baths of any sort, special attention being given to the muscles in which the cramp is most likely to occur.

Another symptom of excitation, which not infrequently occurs when very cold baths are employed, is increase of seminal losses in cases of spermatorrhea due to irritation of the spinal genito-urinary center. In these cases cold applications, if employed at all, should be exceedingly

brief,— not more than one-half minute in duration,— and not infrequently cold applications must be entirely suspended, the neutral sitz bath for half an hour to two hours being substituted.

At the beginning of treatment, patients sometimes complain of a slight or even decided *exacerbation of morbid symptoms* as the result of the procedures to which they are subjected. This may indicate either that the treatment is not yet accurately adjusted to the patient's conditions, or that the curative processes employed are so powerfully alterative or perturbing in their effects that there is an intensification of the effort to restore the patient to a normal condition, the symptoms from which the patient suffers being simply an indication that such a remedial process is in operation. In the latter case an increase of these symptoms need not be considered in any sense discouraging, the patient being thus assured that the measures employed are aiding nature in her curative work.

Measures which are radically curative in character by no means always produce an amelioration of symptoms as soon as they are applied. Time must be allowed for the healing processes of nature to proceed to completion. Recovery from disease is a thing which requires time, like the growth of a plant. Good judgment and good sense are necessary for interpreting the meaning of an exacerbation of the symptoms in a case under hydriatic treatment, whether they are what might be termed accidental, or merely functional symptoms, as, for example, pain, loss of appetite or of energy, or whether they are of a destructive character, as manifested by ulceration, suppuration, sloughing, etc. In any case they can not be regarded as in any way favorable, and demand an immediate change of the prescription or the application of measures for their suppression.

On the other hand, the recurrence of biliary obstruction in the attempt to discharge a collection of gall stones, or a similar recurrence of renal colic may indicate an advance in the curative process. The same may be said with reference to various remedial processes in which there is an evident effort to eliminate some foreign substance or to purify the tissues, as an increased frequency of the recurrence of attacks of headache, an effect sometimes observed in cases of chronic migraine soon after the beginning of a course of hydriatic treatment.

The hydriatrist, of all physicians, must be thoroughly acquainted with the language of disease, with all its pathological processes, and must especially be familiar with the conditions of health as expressed in human physiology. No hydric application for therapeutic purposes is safe or likely to prove successful unless made with the full knowledge of the patient's condition at the moment, and in harmony with the physiological and therapeutic principles involved in the particular case in hand. Routine treatment is always bad enough, but in hydriatic practice it is absolutely dangerous, and destructive alike to the reputation of the physician and to the comfort, and possibly even the life, of the patient.

The application of cold water without friction is one of the best known means of testing a patient's vital state. If reaction is slow, his vitality is at a low ebb. If a mottled cyanotic appearance remains for some time after the cold application, the indication is proof of cardiac weakness, with possibility of impending collapse. This test should be frequently applied in cases of typhoid fever or other grave febrile disorders, and may be used with much advantage as a test for determining the advisability of administering an anesthetic in a case in which there may be some question of the ability of the patient to receive it with safety.

The Average Temperature of Baths. — It will be helpful to the beginner in the use of hydriatic measures to find brought together in small space a statement of the average temperature required for efficient results with the leading forms of baths. These may be briefly stated as follows, the extremes being indicated in ordinary type, the average in bold: —

Douche: cold, 50° to 70°, **60°**; hot, 104° to 125°, **115°**; neutral, 90° to 97°, **95°**.

Affusion: cold, 55° to 65°, **60°**; cool, 70° to 80°, **75°**; hot, 104° to 122°, **113°**.

Plunge: cold, 50° to 70°, **60°**.

Immersion: cold, 50° to 70°, **60°**; cool, 70° to 80°, **75°**; hot, 100° to 106°, **102°**; very hot, 104° to 115°, **108°**; neutral, 92° to 97°, **95°**.

Brand bath: 70° F.

Shallow: cold, 55° to 65°, **60°**; cool, 70° to 80°, **75°**.

Cold wet-sheet pack: **60°** F.

Hot-blanket pack: 130° F.
Sponge bath: 60° to 75°, 70°.
Wet hand rubbing: 45° to 75°, 60°.
Cold friction: 32° to 70°, 50°.
Cold towel rubbing: 40° to 75°, 60°.
Wet-sheet rubbing: 60°.
Hot-air bath: 110° to 180°, 160°.
Local hot-air bath: 200° to 300°, 250°.
Turkish bath: 140° to 250°, 180°.
Russian bath: 110° to 140°, 125°.
Vapor bath: 110° to 140°, 130°.
Foot bath: cold, 45° to 65°, 55°; hot, 105° to 120°, 115°.
Sitz bath: cold, 55° to 65°, 60°; hot, 106° to 120°, 115°; neutral, 92° to 97°, 95°.
Fomentation: 120° to 160°, 140°.

VALUE OF REST AND HYDROTHERAPY IN THE TREATMENT OF CARDIAC DROPSY.[1]

BY W. H. RILEY, M. D.,
Superintendent of the Colorado Sanitarium.

DURING the past few months there have come under my medical care and attention quite a large number of cases suffering with organic valvular lesions of the heart. Many of these cases have had cardiac incompetency, with the resultant symptoms of general dropsy and other disorders which usually follow organic valvular lesions of the heart with incompetency. In the present paper I wish to call attention to the value of rest, hydrotherapy, massage, regulation of the patient's diet, and other rational methods in the treatment of these cases.

I. Rest in Bed.— In these cases of cardiac incompetency with mitral organic insufficiency, the heart is weak and dilated; its contractions are incomplete, often irregular in time and force, and always inefficient; the muscle fibers have lost their normal tone; the cavities of the heart, especially on the left side, are distended by the blood flowing into them, and the heart in its weakened condition is unable to empty itself by its feeble and imperfect contractions. In this embarrassed condition it toils away without fulfilling the purpose of its function, and the result is general cardiac dropsy, and its attendant disorders.

With the heart thus embarrassed and weakened, and unable to do its work, rest of the organ suggests itself as a very proper and rational procedure. It is a well-known physiological fact that the heart has more work to do when the body is in an upright position than when reclining, and still more when one is active than when at rest. By putting the patient to bed, the heart is relieved of a great deal of work. It is given more time to rest, and its contractions become slower, stronger, and more efficient. Rest in bed in a reclining or semireclining position is indicated in any stage of cardiac incompetency, but it is of the greatest importance at the very beginning of cardiac incompetency, when the symptoms of dropsy make their first appearance, or even before, if the heart shows any signs of inability to do its work properly. Rest at this time, with other proper remedies, will often avert a protracted illness and much discomfort, which always attend a well-developed case of cardiac incompetency. In cases where the dropsy is well developed, and the function of respiration is more or less interfered with by the accumulation of fluid in the abdominal or chest cavities, the patient may not be able to take a reclining position, but may be obliged to sit in a half-reclining posture.

II. Tonic Hydrotherapy. — The very best heart tonic with which the writer is acquainted is the brief application of cold water to the surface of the body in some form of bath, attended with friction of the skin. The cold water may be applied to the body in any one of the following ways:—

(1) The wet-hand rub, with water at a temperature of from 40°–60° F.

(2) Cold mitten friction, with water at from 40°–60° F.

(3) The spray or shower bath, at a temperature of from 60°–85° F.

(4) The wet-sheet rub, with temperature of from 70°–90° F.

(5) The alternate application of heat and cold to the spine.

The usual method of applying each of these treatments is as follows:—

(*1*) *The Wet-Hand Rub.* — The attendant has ready a basin or pail of cold water, into which the hands are dipped during the process of rubbing. Only one

[1] Read before the Boulder County Medical Association, May 5, 1900.

part of the body is rubbed at a time; as, for instance, one arm is treated first, then wiped thoroughly dry, then the other arm, or another part of the body treated in the same way. It is important that the treatment should be given briskly and until a good glow is established, and that considerable force should be used in applying the friction; the hands should also be dipped frequently into the cold water during the process of rubbing any particular part, so as to get the greatest benefit of both the cold and the friction.

2. *Cold Mitten Friction.*— The method of applying cold mitten friction is similar to that of the wet-hand rub, except that a large mitten made of fine brilliantine or alpaca cloth is worn on the hand during the rubbing, instead of using the bare hand, as in the wet-hand rub. This mitt should be somewhat larger than the hand, so as to allow space for water inside of the mitt during the process of rubbing. By using this mitt the effect of the cold is intensified, as a larger amount of water is brought in contact with the skin. The effect of friction is also increased by using a mitt of this character, and consequently the total effect of this form of treatment is greater when the mitt is used than when the bare hand is used.

The temperature of the water for both the wet-hand rub and mitten friction should be from 40° to 60° F., according to the condition of the patient. For a patient who is weak and feeble, and one who would not react well to cold, a temperature of 60° should be used. For a patient who has considerable vitality and good powers of reaction, the water should be 40°, or even ice water is sometimes used. These two forms of treatment, that is, the cold wet-hand rub and cold mitten friction, should usually be administered at the beginning of treatment in a case of cardiac dropsy, and as improvement begins, the more heroic measures, such as the cold shower or the wet-sheet rub, may be substituted.

3. *The Spray, Shower, or Douche Bath.* — As above stated, this form of treatment, together with the wet-sheet rub, is best adapted to those cases of cardiac dropsy that have been improved by the use of milder measures, and can now stand more heroic measures, or in cases that have considerable vitality or strength. The spray, or shower, or douche is given by a special apparatus, and should be arranged so that the temperature and pressure can be regulated. It is usually best to begin the spray or shower with warm water, say at a temperature of 100°F., increase to 105°, and then reduce it suddenly to 90°, and even to 70°, depending upon the condition of the patient. The usual length of time for using the cold water should be from 20 seconds to 1 minute. The temperature of the cold water, together with the length of time, should vary with the condition of the patient and his ability to react to cold. In feeble cases the temperature should be higher and the length of time shorter than with patients who are more vigorous. It is always well to use friction while the shower bath is being given, as well as after in the drying process.

4. *The Wet-Sheet Rub.*— This is given by having the patient stand in a foot tub with water at a temperature of about 103° –105°. Four pails of water are procured, at a temperature of respectively 100°, 90°, 80°, 70°. The sheet is first dipped in the water at 100°, and wrapped tightly around the patient. The water at 100° is then poured on the patient, and he is briskly rubbed. Then the pails containing the water at 90°, 80°, and 70° are successively used, and the patient is briskly rubbed during the process of pouring, and for a short interval between each pouring. After all these treatments with cold water, the patient should, of course, be thoroughly dried and rubbed briskly.

5. *The Application of Heat and Cold to the Spine.*— This is given by applying fomentations to the spine for about 5 minutes, and following this by the application of cold, either in the form of ice, or of water at a temperature of from 40° to 60°. The heat should be applied usually for about 5 minutes and the cold from 30 seconds to 1 minute, and this should be repeated at least three times, so that the time occupied in giving this treatment would be about 18 or 20 minutes. It is important to apply the cold to the spine sufficiently long to counteract the effect of the heat, and until the skin feels cold to the hand, which usually takes from 30 seconds to 1 minute. This point is often slighted by many who use this treatment, the cold not being used long enough. It is important, also, that the cold be not used too long, so as

to give any depressing effect from it. A good guide is to apply the cold until the skin of the patient feels cool to the hand of the attendant.

The effect on the circulation of these various forms of cold treatment is as follows: The heart is made to contract more forcibly and more slowly; the muscular coats of the arteries and blood vessels are also made to contract more forcibly; and the total effect upon the heart and blood vessels is to increase blood pressure and to improve the circulation. The value of these remedies in cases of cardiac dilatation with incompetency can be appreciated when we remember that the contractions of the heart are usually weak, incomplete, and inefficient, and the blood vessels are in a very similar condition to the heart; that is, they are relaxed and weak, the muscular coats of the blood vessels having lost their tone, and the whole vascular system being in a weakened and relaxed condition.

Cold, when applied to the surface of the body, acts as a physiological stimulant to the peripheral nerves; and this stimulation, by acting in a reflex manner on the nervous system, causes the heart to contract more vigorously and more slowly, and also causes increased tone in the muscular coats of the blood vessels. The friction that is used in these various cool treatments causes an active dilatation of the peripheral blood vessels of the surface of the body, and this lowers peripheral resistance to the circulation of the blood.

It will thus be seen that by the use of cold water in any one of the ways above described, the circulation is aided in at least two ways; first, by increasing the propelling force that moves the blood onward; second, by diminishing the obstruction to the onward passage of the blood by dilating the peripheral capillaries.

The alternate application of heat and cold to the spine acts as a cardiac stimulant in a manner somewhat similar to the application of cold over the body generally. By alternating the heat and cold and applying each for a short time, the stimulating effects of both heat and cold are obtained.

The accompanying illustrations show the effect of a cold shower bath upon a normal pulse, and also upon a pulse in which the blood pressure was very low. Figure 1 is the tracing of the pulse of a healthy young man. Figure 2 is the tracing of the same young man after taking a shower bath at 70° F. for 1 minute. Figure 3 is a tracing from a case in which the blood vessels were very much relaxed, and the muscular coats of the blood vessels weak and the blood pressure low. It will be noticed from this tracing that the percussion wave is high, and the dicrotic notch is deep, and the end of the pulse curve reaches the horizontal or base line, and remains there some little time before making another ascending curve. All of this indicates a weak condition of the blood vessels, a weak heart, and low blood pressure. This condition was decidedly changed by giving the patient a shower bath at a temperature of 80° F. for 1 minute. Figure 4 illustrates the condition of the pulse in this case after a shower bath. This last tracing, as shown in figure 4, indicates that blood pressure has increased, and that the muscular contraction of both the heart and the arteries has been increased.

It should be said in this connection that the effect of the shower bath upon the circulation is maintained for a considerable time after the treatment, and can be maintained almost continuously in most cases by repeating the cool treatment three or four times daily.

The use of massage in the form of general massage, or of centripetal friction, or manual Swedish movements, as they are usually described under Schott's method of treating cardiac weakness, may be used to good advantage in connection with the methods above described. These forms of treatment may be given from three times a week to once a day in connection with the cold treatment.

The use of the faradic current applied in the form of faradization is also a valuable adjuvant in the treatment of cases of cardiac dropsy. The electricity, by causing the muscles to contract, tends to squeeze the blood out of them, and aids in the circulation. The electricity also causes the muscular coats of the blood vessels to contract, to some extent at least, and this, also, is an aid to the circulation.

By the use of these remedies,— that is, rest, tonic hydrotherapy, massage, manual Swedish movements, and the faradic

current,—the writer has been able to relieve a large number of cases of cardiac dropsy in middle life. Many critical cases of this disease have come under my care after having given drugs and all forms of cardiac stimulants and tonics a thorough trial without relief, and have been entirely relieved by the use of the foregoing remedies.

I should not forget to state, before closing that there is a class of cases in which, in addition to the organic valvular lesion of the heart, there is an atheromatous condition of the blood vessels, and usually organic disease of the kidneys.

In this class of cases the cold bath is not recommended, and if used, it should be employed with the greatest caution. But in the class of cases above referred to, where the blood vessels are relaxed, and not atheromatous, nor the heart dilated, the cold bath in some form is of the greatest benefit. In an ordinary case, by its use in connection with rest in bed, the dropsy is lessened, and the amount of urine is rapidly increased from increasing the blood pressure through the kidneys. The improvement is thus rapid and continuous until the dropsy has entirely disappeared.

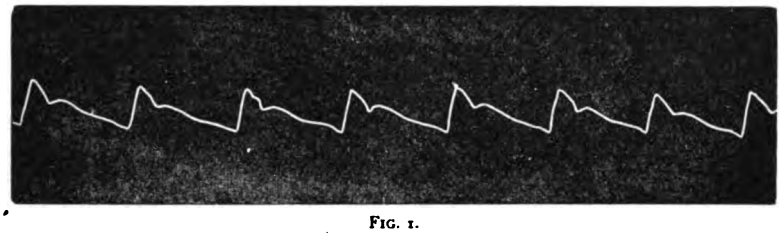

FIG. 1.

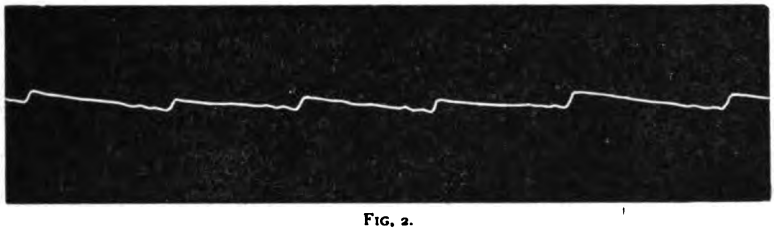

FIG. 2.

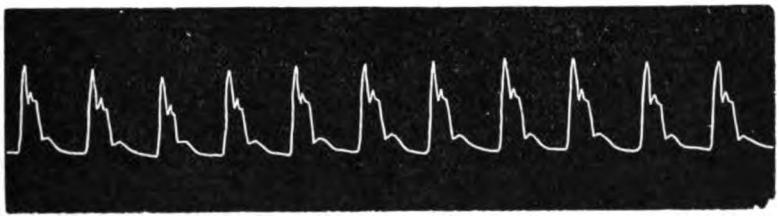

FIG. 3.

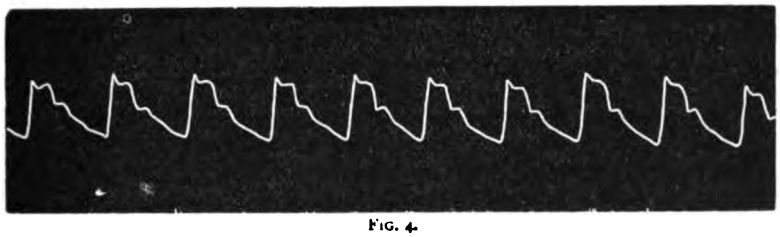

FIG. 4.

The Most Efficient Means of Combating Tuberculosis.— Dr. N. S. Davis calls attention to the fact that the germs of tuberculosis are universally spread, and that success in combating it depends on the efficiency of our efforts to restore and maintain in their full vigor the natural conditions and processes of vital resistance possessed by the living body against toxic agents.

TRANSLATIONS AND ABSTRACTS

[The articles in this department are prepared expressly for this journal.]

THE INCREASING PREVALENCE OF CANCER AS SHOWN IN THE MORTALITY STATISTICS OF AMERICAN CITIES.

G. BETTON MASSEY, M. D. (*Am. Jour. Med. Sci.*, February, 1900), in a paper on this subject, states that after many years' inattention to the subject, the medical profession has recently awakened to the fact that mortality statistics show a rapid increase in the prevalence of cancerous affections during the last thirty or forty years. According to several writers, this increase has not occurred in the less civilized countries of the world, though it is evident that exact information on this question is necessarily lacking, and particularly so when we remember that the collection of vital statistics is a governmental duty that is liable to be discharged by civilized countries in a manner closely in unison with their position in the scale of civilization, and that those collected by many countries ranking high in the scale leave much to be desired in accuracy and fullness.

It is, nevertheless, the opinion of competent observers that cancerous affections are not common among barbarous peoples. Herbert Snow, of the Brompton Cancer Hospital, in London, states in a recent work that Davidson's "Geographical Pathology," published in 1893, while showing the prevalence of cancer in Europe and the United States, affirms its rarity or entire absence in Arabia, east central Africa, Bechuanaland, Färöe Islands, the Gold Coast, Guiana, Iceland, Jamaica, Mauritius, New Caledonia, and Persia, with a conflict of testimony with respect to Abyssinia.

Concerning the prevalence and increase of these affections in the most highly civilized countries, the testimony is exact and most startling. The figures given by the registrar-general's report for England and Wales during thirty-one years, show that there has been an increase from 38.5 persons dying from cancer in 100,000 living population in 1864 to 75.5 dying from cancer in 100,000 living in 1895; in other words, the ratio of the mortality from cancer has almost exactly doubled in England and Wales during the thirty-one years preceding 1895. Snow states that the deaths from cancer in Ireland in 1864 were 1,498, with a population of 5,678,307. In 1884, with a decrease of population to 4,962,693, an increased mortality from cancer of 1,947 is recorded. In Scotland the population in 1864 was 3,118,701, with 1,300 victims of cancer; in 1884 the population was slightly increased, and the cancer mortality was 2,110.

The condition of affairs is probably becoming quite as bad in America, and in a recent paper Roswell Park makes the prediction that if the present rate of increase of cancer in New York State continues during the next ten years, its mortality will become greater than that of consumption, typhoid fever, and smallpox combined.

The greatest increase has occurred in the city of San Francisco, where the ratio has crept up from 16.5 cases in 100,000 population in 1866 to 103.6 cases in 100,000 in 1898. This enormous increase of more than six times as many in thirty-two years is deserving of special attention by the people of that city.

The city of Boston shows the next most considerable increase, the ratio of cases to living persons having almost trebled in the twenty-four years between 1863 and 1887. After the latter date there was a temporary decrease, followed by a tendency to increase to the present time.

In the seven largest American cities, exclusive of Chicago, with a combined population in 1870 of 8,207,464, there were 999 deaths from cancer, or 35.4 deaths per 100,000 living persons. In 1898 the population of the same cities, inclusive of Brooklyn, now a portion of New York, was 7,035,235, and there were 4,273 deaths from cancer, or 66.4 deaths per 100,000 living persons, showing that the ratio of cancer deaths to the living inhabitants of these cities had almost doubled in the comparatively short time of twenty-eight years.

The author believes that if the same rate of increase is maintained until 1910, there will be an average of 80 deaths in each city in that year to every 100,000 living persons.

THE BLOOD IN DISEASES OF THE CARDIO-VASCULAR SYSTEM.

STENGEL has made an extensive series of observations on this subject (*Proc. Path. Soc.*, of Philadelphia, 1899), more especially with reference to the acute inflammatory lesions, atheroma, and arterial degenerations, and lastly in cases of mechanical lesions, such as those in chronic valvular disease. In acute endocarditis of either type there is rapid reduction in the number of red corpuscles, even as much as 60 or 50 per cent. Leucocytes are generally increased in number, and polymorphous cells may be particularly abundant, reaching 98.5 per cent. Bacteriological examination frequently shows the presence of organisms, and the writer mentions the gonococcus as important. Examination of the blood in atheroma and chronic valvular disease does not always yield much information. Sometimes fatty particles and detritus have been observed.

The writer draws attention to the curious fact that anemia is often more apparent than real in some cases. In valvular disease there is a considerable variety of results obtained. Reduction of pressure sometimes seems to be followed by diminution in the number of red corpuscles, but the writer finds that this is by no means the rule, as in cases showing marked loss of compensation he sometimes obtained a high increase in the number of corpuscles, reaching in some instances 500,000 per cubic mm.

It is very frequent to find a polycythemia in cases of chronic cardiac disease with continuous slight inadequacy of circulation, and in cases of congenital heart disease the number of red corpuscles may be as many as 8,000,000 per c. mm. This has been explained by saying that disturbance of the distribution of water in the system is the cause of it, on account of the continually reduced blood pressure and vascular dilatation, whereby there is a loss of liquid from the blood, especially through the lungs (Grawitz). Stengel does not incline to this view on experimental grounds, and he adds, therefore, that the rapid fluctuations or the failure of polycythemia to occur in some cases in which all the conditions are present by evaporation or loss of fluid, shows that this explanation is not adequate. The author's own view is rather that disturbance of the distribution of the corpuscles plays an important rôle, and he quotes the known fact that the number of corpuscles present in the cutaneous vessels of the dependent parts is greater than in others, a fact which has been verified by the writer on previous occasions. He also quotes the observations of J. K. Mitchell on the influence of massage on the constitution of the blood, which shows that the number of blood corpuscles progressively increases after massage. This is apparently due to the introduction into the circulation in considerable numbers of corpuscles which would tend to cause the lagging of red cells in the peripheral arterioles or venules. Probably failing cardiac disease is an important factor here, but possibly evaporation, as Grawitz believes, may contribute to the result.

The writer has himself observed the fact, which is possibly of importance, namely, that viscosity of the corpuscles increases in cyanotic conditions. This is markedly the case in blood drawn from a ligatured finger, and perhaps in the cyanosis of valvular lesions the same effect obtains. This would obviously tend to restrain corpuscles in peripheral tissues. The leucocytes in chronic valvular disease also show increase in number, but the amount of leucocytes is neither striking nor uniform.—*British Medical Journal, April 14, 1900.*

THE PLANTAR REFLEX IN HEALTH AND DISEASE.

DR. JOSEPH COLLIER (*Brain*, Vol. 1, 1899) reported results of investigations of the plantar reflex in (1) one hundred healthy adults; (2) one hundred healthy children; (3) three hundred cases of nervous disease.

The normal reflex is best obtained by placing the patient in the supine position, with the lower limb semiflexed at the hip and the knee, and rotated out with the knee resting on a pillow, so as to insure muscular relaxation. Light scratching or tickling the sole of the foot is more efficacious than more severe and painful stimuli. Coldness and sensible perspiration of the foot make it very difficult to obtain, the latter lessening the element

of friction so necessary for the production of the skin reflexes.

When a stimulus is applied to the sole of the foot of a healthy adult, there results a definite order of succession in the contraction of the muscles which respond, and the contraction is more vigorous in those muscles which respond earlier than in those which react later. The order of contraction in all the normal cases was found as follows: —

1. Contraction of the tensor fascial femoris, sartorius, and adductors, and flexion of the hip.
2. Flexion of the four outer toes.
3. Dorsiflexion of the ankle.
4. Flexion and adduction of all the toes; inversion of the foot by the tibialis posticus; flexion of the knee.
5. Contraction of the calf muscles.
6. Contraction of the quadriceps.

As the tensor fascial femoris is the first to appear, so also is it the last to disappear. Often it is found to be lively when no other muscle reacts to stimulation of the plantar region.

The normal plantar reflex in infants differs markedly from the adult reflex, in that stimulation of the sole of the foot produces an *extension* of the toes, and a *late* response of the hip muscles. This contrasts strongly with the *flexion* of the toes and an *early* response of the muscles of the hip in adults. The infantile *extensor* response persists until the child learns to walk, or until the pyramidal system of fibers is fully developed, when the reflex assumes the adult form. The plantar reflex is changed in pathological conditions. In almost all cases of lesions of the pyramidal system the plantar response resembles closely that found in infants,—*slow extension* of the toes, and late contraction of the hip muscles. This change in the form of the reflex is one of the first signs of such lesions to appear, and is the last to disappear when the lesion is temporary. It may be the only unequivocal objective sign of a lesion of the pyramidal system. This form of reflex is never found under other conditions in adults, and is a sign of great clinical value, as it easily determines whether an exaggerated knee-jerk or the presence of a foot clonus is due to functional disturbance or to an organic lesion.

In cases of total transverse lesion of the cord, the *extensor* response is the only reflex phenomenon present in the lower limbs. In tabes the plantar reflex is lost in twenty per cent of cases. The response, when present, is often confined to the hip muscles, and if found in the foot is flexor. The same is true of peripheral neuritis. In cerebral and cerebellar tumors the flexor response occurs if there is no involvement of the pyramidal fibers.

In functional cases the plantar reflex is difficult to elicit, and there is frequently no response in the foot, but in such cases a response may usually be obtained in the hip muscles. The form of the reflex is the flexor response.

In neurasthenia, chorea, paralysis agitans, poliomyelitis, myopathy, and sciatica the flexor response is found.

The Application of Cold in Heart Disease.— Robardet (*Thèse de Paris*, 1899) believes that the indications for the use of ice applied to the precordium in affections of the heart are pericarditis, endopericarditis, endocarditis, and more particularly myocarditis, pseudo-angina and certain forms of tachycardia may also be benefited. The contraindications are a previous aortitis, atheroma, aneurism, or thinning of the aortic wall from any cause. The crushed ice may be applied in a bladder or in an India-rubber bag. The quantity of the ice should not be so great as to incommode the patient by its weight, and a layer of flannel should be interposed between the receptacle and the skin. To obtain the best results there should be continuous application of cold, but the patient must be carefully watched at the beginning of the treatment, as the individual reaction is variable. Cases are quoted in which it has been employed with success in valvular diseases, tachycardia, and in various cardiac irregularities. A regular action of the heart was obtained in the large majority of the cases from a single application.— *British Medical Journal, Jan. 27, 1900.*

Only 1,400 Sunny Hours a Year in London.— Statistics obtained by sunshine records are interesting. Some curious facts have been recently published by the French meteorological bureau at Paris.

Spain has 3,000 hours of sunshine a

year; Italy, 2,700; France, 2,600; Germany, 1,700; while England has but 1,400.

The average fall of rain in the latter country is greater than that in any other European country. In the northern part and on the high plateaus of Scotland, about 351 inches of rain fall a year, and London is said to have an average of 178 rainy days in the year, and fully ten times the quantity of rain at Paris.—*Public Health Journal.*

Prevention of Tuberculosis.—Homer M. Thomas is authority for the statement that the most fertile source of infection with tuberculosis is from the sputum, which, when dried, gains entrance into the body. This being the case, the necessity of patients' being taught to destroy the sputum before it passes from their control, is patent to all.

Chronic Dyspepsia Successfully Treated with Peroxide of Hydrogen and a Carefully Selected Dietary.—Geo. A. Gilbert, M. D. (*New England Medical Monthly*, December, 1899), calls attention to a method of rational measures used by him in the treatment of a persistent case of chronic dyspepsia.

The patient, aged forty, a robust looking man, would not have been considered ill were it not for the prominent dark rings under his eyes, his injected conjunctivæ, and a drawn expression of the face, indicative of some serious disorder. Six years ago he suffered from an attack of acute gastritis, after which he never felt so well as previously. He gave the typical symptoms of one suffering from a severe chronic gastritis. The patient had tried all sorts of medicines, with the result that he was in a worse condition.

On examination the author found the patient slightly feverish, pulse rapid, tongue flabby and heavily coated, while the teeth and cavity of the mouth were covered with a foul-smelling, sticky mucus.

The case was one in which antiseptics were clearly indicated. Ozonized water, made of one part of hydrozone to four parts of water, was prescribed as a mouth wash. In order to combat the fermentative changes which were taking place in the stomach, a mixture of one ounce of hydrogen and two quarts of sterilized water was made. The patient was directed to drink half a tumblerful half an hour before meals. A dram of glycozone diluted in a wineglass of water was ordered to be taken half an hour after meals. Directions were also given as to the selection of proper foods, and the manner in which they should be eaten.

These simple procedures gave satisfactory results, and at the end of a fortnight the patient reported that for the first time in six years he was able to eat his meals without dread of subsequent distress and eructation of gas.

Hygiene versus Antitoxin.—In a statistical study of the antitoxin treatment of diphtheria (abstract of a paper in the *Medical Record*) it is stated that it must not be forgotten that in late years there has been a decline in the death-rate of other infectious diseases than diphtheria, against which no new remedy has been directed. Thus, while in German cities the present mortality from diphtheria is still 41 per cent of its former rate, the typhoid fever death-rate is only 35 per cent of what it was during 1877 to 1894. In St. Petersburg between 1885 and 1889, the typhoid fever mortality was 7 per 10,000 population, and only 4 during 1890 to 1894.

Kassowitz shows that the scarlet fever mortality in the German cities decreased 30 per cent, and that of diphtheria only 20 per cent, from 1895 to 1896.

Much of the decrease in the infectious disease mortality is due to sanitary improvement, and this is one factor which is usually ignored when the antitoxin question is considered.

Another thing which should be kept in mind is this: Antitoxin statistics are based on the treatment of cases which have been diagnosed by the microscope as being diphtheria; and comparison is made with the results of treatment in the past of cases which were diagnosed on their merits as being examples of clinical diphtheria. This factor, in increasing the number of cases reported and thus reducing the case fatality, is admitted by Lotz and Tavel and others, and it is a fatal admission; it cuts off the last leg of the antitoxin argument.—*Medical Times, January, 1900.*

The Treatment of Trigeminal Neuralgia with Galvanism.—Dubois (*Bull. Gen. de Therap.*, March 8, 1900) refers to successes in the treatment of tic douloureux with the constant current recorded by Onimus, Legros, Niemeyer, Benedikt, and Dalby. His own patient began to have neuralgic paroxysms at the age of forty. For ten years he was treated with many different drugs, but without relief. At fifty-one he commenced to receive electrical treatment. The positive pole, divided into three terminals by means of a divided rheophore, was applied to the supraorbital nerve, the infraorbital nerve, and at the mental foramen. The negative pole was placed on the neck, opposite the superior cervical ganglion. From twelve to fifteen milliamperes, as it is estimated, were passed for seven minutes. An amelioration of the symptoms at once began, and after a week's treatment he obtained absolute freedom from the attacks. The treatment was continued three times a week for a year. As a consequence, he has remained free from even the slightest paroxysm for twenty-six years. Besides the above case, three others have been treated by the same method. One, the subject of five surgical operations, was not relieved; in the other two, an apparent cure was effected; at any rate, an extraordinarily long remission of the pain resulted.—*British Medical Journal, April 14.*

Gastrcintestinal Infections in Infants.—A. Abt, M. D. (*Medicine*, 1900, page 94), in an article on this subject, concludes:—

1. The acute gastrointestinal disorders of children can not be attributed to a specific form of bacterium.

2. Toxic symptoms of gastrointestinal infections depend upon the introduction into the alimentary canal of poisonous substances which are contained in the food. For example, Vaughan isolated a toxic substance, tyrotoxicon, from milk, which was poisonous for man and animals.

3. Bacteria may be introduced from without; or the ordinary saprophytic bacteria which inhabit the intestinal canal may take on a special virulence.

4. The most severe disturbances are caused by the metabolism of bacteria; these micro-organisms by their activity either produce acids or cause decomposition of albuminoid substances; the products act as powerful irritants to the intestines; and by injuring the intestinal wall gain access to the blood and lymphatics, in this way producing the local and constitutional symptoms.

5. There can be no doubt that specific intestinal infection may occur in infants. Typhoid fever, though not frequent in very young children, may also occur.—*Pediatrics.*

Treatment of Lupus and Skin Diseases with X-Rays.—Albers-Schonberg and Hahn R. (*Münch. Med. Wochenschr.*, 47, 1900, pp. 284, 325, and 363), in an exhaustive article, consider the action of X-rays upon diseased and healthy skin. They followed up the microscopical changes of the affected skin under the influence of X-rays by microscopical examinations, and after reporting a series of cases, arrived at the following conclusions:—

1. X-rays act favorably upon lupus and other skin manifestations.

2. They remove concomitant eczema and elephantiasic infiltration around the lupus, and, are—

3. Consequently of value when we have to treat large, flat surfaces.

4. Relapses occur with this method as well as with others.

5. Other methods are not excluded when X-rays are applied.

6. By judicious use and sufficient technical knowledge all the undesirable effects, as dermatitis, excoriations, gangrene, etc., are surely avoided.—*Jour. of Cut. and Gen.-Urin. Diseases.*

Sun Baths in the Treatment of Tuberculous Joints.—Millioz (*Thèse de Lyon*, 1899), unlike Finsen, of Copenhagen, who used the ultraviolet rays of the spectrum in the treatment of lupus, has employed all the rays of sunlight to act on tuberculous joints. He disapproves of the systematic fixation of the limb in which the tuberculous lesion is situated. The patient is placed on a suitable couch in the sunniest part of the garden or other open place, with the affected joint fully exposed to the rays of sunshine. To protect the head of the patient, some sort of sunshade may be improvised. If the

upper limb is the seat of the disease, the patient may preferably be allowed to walk about in the garden. The duration of the sun bath should be several hours a day. During the intervals the joint is covered with wool, and rather firmly bandaged. Sometimes after the first or second bath the joint becomes more painful, but this soon passes away in most cases. If it should continue, it may be necessary to intermit the treatment for several days. Rapid pigmentation of the skin by the sun's rays has been noticed to coincide with comparatively quick recovery. The joints are said to become smaller, the skin healthier looking, the discharges, if such be present, less purulent, and the fistulæ close. Such results, however, may require months of treatment. —*British Medical Journal, Feb. 10, 1900.*

The Vagus in Relation to Measles.—Cioffi (*Rif. Med.*, March 2–5, 1900) believes the greater part of the more serious complications of measles can best be explained by supposing that the measles toxin exerts its chief action on the vagus and its branches. This supposition derives support from the cases of measles with intense suffocative catarrh without definite pulmonary lesion, from the prevalence of gastric symptoms; and, above all, from the very large preponderance of ear complications. Indeed, the author supposes that all the various complications of measles may be explained by supposing that the toxin attacks one or more of the branches of the vagus; even the renal troubles sometimes observed are credited to an affection of the vagus, the albuminuria being considered of the "nervous" type. The not infrequent development of tuberculosis after measles is attributed to the increased vulnerability of the lung, due to the weakening of the trophic influence of the vagus. —*British Medical Journal, April 7.*

Good for Burns.— Seventy-five grains of picric acid dissolved in two ounces of alcohol, to which a quart of water is added, makes an excellent application for burns. There is nothing which deadens the pain better. It should not be used after granulation begins to take place.— *International Journal of Surgery.*

The Simple Electric Bath for Rheumatoid Arthritis. — Dr. James Taylor (*Clinical Journal*, October 11), in a clinical lecture, says that a condition of a very painful nature is rheumatoid arthritis, and very great relief is often afforded in that disease by galvanism applied in the electric bath. This is simply an ordinary bath with one of the poles immersed in the water and the other stroked over the painful parts. So there is nothing mysterious about the electric bath; it can be given with an ordinary bath and an ordinary galvanic current.

There is nothing very new, of course, in this, but it is well to remind the general practitioner of its simplicity as well as its efficacy.— *N. Y. Medical Journal, Nov. 11, 1899.*

Artificial Production of Gout.— H. Kionka (*Berl. klin. Wochen.*, Jan. 1, 1900) calls attention to the fact that gout is observed in certain animals and birds as well as in man. In the common fowl of the barnyard, gouty manifestations may be produced by the introduction into the body of chromic, oxalic, and carbolic acids, acetone, aloin, sublimate, and sugar candy. Kionka was led to experiment along this line, and placed a number of hens under good conditions, confining them entirely to a diet of chopped lean horse flesh, which was fed them twice daily. They were allowed to drink as much water as they wished. After a varying interval, averaging about four months, the fowls began to show evidences of disease, which gradually assumed the characteristics of true gout.— *Medical Record, Jan. 27, 1900.*

Changes in the Skin in Paralysis Agitans.— Reuling (Maryland *Med. Jour.*, March, 1900) calls attention to changes which take place in the skin of patients suffering with paralysis agitans. The change is readily noticed in the skin of the forehead. The patient is asked to look upward for two minutes, and then downward. In this disease three or four minutes elapse before the wrinkles disappear. Fraenkel, who first called attention to the skin changes, attributes them to a thickening and loss of elasticity. A microscopical examination of a case showed an increase of connective tissue.

The Value of Blood Examination in Gynecology. — Giess (*Am. Jour. Obst.*, August, 1899) lays stress on the value of the blood count in certain gynecological cases. A leucocytosis of ten thousand per cm. or more in a woman with pelvic pain, after all acute symptoms have subsided, points strongly toward suppuration of some of the pelvic organs, provided, however, that diseased conditions of the blood and other organs have been eliminated.

Actinomycosis of the Liver. — M. Letten (*Gazette Hebdomadaire de Medecine et de Chirurgie*, January 25) recently attended in his hospital service a woman, thirty-five years of age, with very considerable ascites, and in whom there existed in the region of the umbilicus a small fistula whence flowed a sanguinolent discharge containing actinomyces. The patient died the day after admission, and on autopsy it was found that the fistula communicated with an extensive abscess situated in the right lobe of the liver. There were in the viscus also many other small abscesses, all containing actinomyces. A careful examination of the pharynx, tongue, jaw, etc., failed to disclose any point of entry for the parasites. — *New York Medical Journal, March 24.*

Ichthyol in the Treatment of Fissure of the Anus. — Conitzer (*Münch. Med. Woch.*, 1899; *Centralbl. für Gynäk.*, December, 1899) obtained most satisfactory results in the treatment of anal fissures with ichthyol. The fissure is first anesthetized with cocain, and pure ichthyol is applied with a bit of cotton on a glass rod. For subsequent applications, which are made every other day, anesthesia is generally unnecessary. Cicatrization is usually very rapid, and stretching of the sphincter is not necessary. The bowels must be kept free. — *New York Medical Journal, March 17, 1900.*

The Consolidation of Medical Missions. — Recently the International Order of the Double Cross was organized in New York for the object of uniting all the medical missions and medical missionaries throughout the world. The membership is open to physicians, medical students, and nurses of both sexes, the active memberships to be divided into four guilds, — physicians, students, nurses, and helpers, — and all medical missionaries are to be considered as honorary members. The following officers have been elected: President, Dr. G. D. Dowkontt; secretary, Cyril H. Haas; treasurer, the Rev. W. W. Smith, M. D.; registrar, the Rev. Theodore F. Hahn. These, with Drs. J. B. Busteel, W. Steward, and H. Zeckhausen, form the executive council.

War on Cigarettes. — The *Medical Record* states that a bill has been introduced into the New York Legislature to regulate the sale of cigarettes. Dealers must obtain a tax certificate, and must make oath that the cigarettes to be sold contain no injurious drugs or narcotics. The application for a certificate must be signed by five reputable citizens of the place where the applicant resides, and no cigarettes can be sold to persons under eighteen years of age.

Three Hundred Pounds of Cow's Excrement Consumed Daily. — Professor Conn, of Wesleyan University, in a discussion of the subject of dairy bacteriology, made the statement that the ordinary sediment from milk, when observed through the microscope, is found to consist of sticks, insects' legs and wings, hay, blood, and pus; in fact, almost everything possible in the way of dirt, a large part of it being excrement. It had been estimated that New York City consumes, daily, three hundred pounds of cows' excrement.

Treatment by Cold Baths in Typhoid Fever in Children. — F. Glénard, to give an idea of the mortality under drug treatment, reviews 1,745 cases studied, and finds the mortality fifteen per cent. Under strict bath treatment, the results of a number of reporters give a total of 503 patients with 18 deaths, or 3.5 per cent. Studying cases treated by baths or moist temperature lower than that of the patient's fever, but not in a systematic manner, he arrives at the conclusion that eleven per cent represents the mean mortality. Other statistical data are given, and the article is to be continued. — *Revue de Therapeutique, Jan. 15, 1900.*

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

Bacteriology of the Accessory Sinuses of the Nose.—Pearce (*Jour. Boston Soc. Med. Sci.*, March, 1899) has made a careful bacteriological examination of the accessory sinuses of the nose, particularly the antrum of Highmore, in fifty cases after attacks of diphtheria and scarlet fever. The author points out the readiness with which an infection of the nose may extend to the accessory sinuses. The cases which he examined were divided as follows: Diphtheria, 39; diphtheria complicated by scarlet fever, 5; complicated by measles, 2; scarlet fever, 4. In the 39 cases of diphtheria there were inflammatory changes present in both antra, 16; in both antra, sphenoidal and ethmoidal sinuses, 2; one antrum only, 5; sphenoidal sinuses only, 2. In these the exudate varied, being in some cases a thick yellow pus; in others, a sero-purulent fluid; in some, a thick, cloudy, serous fluid; in 1, a purulent fluid; in 1, a purulent fluid with membrane; in 1, a cloudy serous fluid with membrane; in 7, a thin mucoid fluid. The bacillus of diphtheria was present on both sides in all but three cases; in one of these latter a streptococcus only was found, and in the other two the bacillus of diphtheria on one side, and the pneumococcus on the other. Staphylococci aureus and albus were also present in some; the pneumococcus in 3, and the bacillus in 4. In those cases of diphtheria associated with measles, streptococci were found associated with the diphtheria bacillus in both, and in one of these cases both middle ears were purulent, and contained the same micro-organisms as the antra. In the 5 cases of diphtheria with scarlet fever, the antra were unaffected in 3, but the other two showed inflammatory changes. Cultures of one of these showed a diphtheria bacillus associated with several unrecognized forms of bacteria, while the others showed streptococci and staphylococcus pyogenes aureus. The sphenoidal and ethmoidal sinuses also contained streptococci. In the 4 cases of scarlet fever the antral cavities were normal in 1; of the other three, one showed a double empyema in which streptococci and various staphylococci were found. A thick, greenish pus was found in both antra, and the sphenoidal sinus in another, and in this case, in addition to the same organisms already mentioned, the bacillus pyocyaneus was present. A histological examination of the infected tissues showed inflammatory changes in many cases.

From his investigations the author concludes that infection of the antrum of Highmore is quite common in fatal cases of diphtheria and scarlet fever, and that the diphtheria bacillus is frequently associated with pus germs. An important point to be considered is whether or not infection takes place in cases which do not prove fatal. The author is of the opinion that such an extension takes place in a large percentage of cases.

The slowness with which the antrum of Highmore drains itself has an important bearing on the question of transmission of the disease by means of retained pathogenic germs.

A New Form of Diplococcus Scarlatinæ.— W. J. Class (*Interstate Medical Journal*, January, 1900) describes an involution form of the diplococcus scarlatinæ which he has not previously described. It closely resembles the influenza. Upon careful examination it is found to be an elongated diplococcus. The author does not believe it to be a continuation, for the following reasons:

"1. Because it is impossible to isolate it, although numerous attempts have been made.

"2. It has never been found by him except in cultures of the diplococcus scarlatinæ.

"3. It is very seldom found in primary cultures of this organism, occurring as a rule in subcultures in which the large diplococcus has divided into smaller organisms.

"4. Because when a culture of the diplococcus containing this form was injected into mice, the organism obtained in primary culture from its blood and organs was a diplococcus which did not show this form, although in subcultures it again appeared.

"5. Because in subcultures made from cultures in which this form was present in comparatively large numbers it was

not found, thus showing that it could not have a separate existence.

"6. Because the mode of division of the diplococcus into these diplococci can be seen in stained specimens of the organism."

Prostatic Abscess Due to the Pneumococcus.— Guillon, of Paris (*Le Progres Medical*, Nov. 11, 1899), reports a very interesting case. The history of the case shows that the man had chronic urethrocystitis with stricture for a number of years. Four days after treatment by dilatation he had a light attack of broncho-pulmonary grippe. Then followed some prostatitis, but with no signs of pus formation. Some days after that he was seized with a sudden chill, and examination revealed the presence of a fluctuating abscess in the prostatic region. The pus was evacuated, and uneventful recovery followed.

Bacteriological examination of the pus revealed the presence of the pneumococcus in pure culture. This is the only case on record of prostatic abscess caused by the pneumococcus. The writer does not attempt to explain how infection of that kind ensued.

Action of Soil on the Plague Bacillus.—Dr. Z. Yokote (*Centralblatt für Bakteriologie*, Abth. I, XXIII, No. 24) took mice that had died of infection with plague bacilli, placed them in wooden boxes, and buried them in garden soil which was kept from thorough drying. The boxes were exhumed from time to time, and the contents examined to ascertain if infected material still existed. The longest time that elapsed between the burying and the demonstration of the still virulent organism was thirty days; and the more active the rate of decomposition, the shorter the life of the organism. The soil in the immediate vicinity of the boxes was examined for the organisms, but the results were negative.

The Demonstration of Tubercle Bacilli in Feces.—Rosenblatt (*Centralbl. f. inn. Med.*, July 22, 1899) gives tincture opii in a case of suspected intestinal tuberculosis until the stools become hard and formed. If scrapings from their surface, or any muco-purulent secretion adherent to it are then examined, the bacilli, if present at all, will be found in the first specimen prepared. The reason for this is that the bacilli, situated on or immediately below the surface of the intestinal ulcers, adhere to, and are carried down by, the hard scybala, while they become lost in the volume of the ordinary liquid tuberculosis stool, and are demonstrable, if at all, with the greatest difficulty.—*British Medical Journal, Jan. 13, 1900.*

How Long after Burial Is Infection from Diseased Animals Possible?— E. Klein (*Centralbl. f. Bakt.*, 1899) injected animals with different pathogenic bacteria, which immediately after death were buried in tin or wooden boxes, or directly in sand or damp earth without any box. The bodies were exhumed after varying lengths of time, and other animals injected with preparations made from the diseased parts. In case of the bacillus prodigiosus the results were negative after the animal had been buried six weeks. Staphylococcus produced no effects after being buried two months, the cholera bacillus after twenty-eight days, the typhus bacillus after twenty days, diphtheria after twenty-one days. Tuberculosis was tested only after burial for seven weeks, and produced no effects. Specimens injected with a preparation from an animal that had died of bubonic plague and had been buried twenty-one days were not affected. The results of these experiments give evidence that bacteria do not live long in dead bodies, and that the power of infection is soon lost. —*Journal of Applied Microscopy, January, 1900.*

Virulence of Bacterium Coli in Children's Stools.— Mellin (*Der Kinderarzt*, Vol. X, No. 12) isolated the bacterium coli from the stools of one healthy infant and from twenty-one cases of gastro-enteritis. Experiments on animals proved that the virulence of these germs varied greatly, causing death in a few hours, or again calling forth only transitory symptoms of illness. The colon bacillus obtained from the healthy child was not pathogenic. It is probable that we have a pseudo-colon bacillus, as well as a virulent one, to deal with.—*Am. Jour. of Obs. and Dis. of Women and Children, February, 1900.*

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EFFECTS PRODUCED BY DIFFERENT FORMS OF THE COMPRESS.

THE reflex effects resulting from localized hydriatic applications differ in both intensity and quality, according to their duration and temperature. In the following paragraphs the practical application of the reflex effect is illustrated by means of the compress. The same principles may be applied to other procedures as well.

1. Internal reaction, with dilatation of visceral vessels, occurs almost instantly after a *short cold* application, for the reason that the cause of the reflex vascular spasm (the cold application) being removed, the heat of the surrounding tissues (100° to 106°) quickly relaxes the parts. The rhythmical activity of the vessels of the part and the amplitude of their contractions are increased through the stimulation of the controlling ganglia. As a result, the supply of blood is increased, and with this arrive fresh and enlarged supplies of oxygen, leucocytes, and nutrient material. There is also a more thorough removal of CO_2 and other waste products, and hence an increase in the normal vital activities of the part, a higher grade of life, better tissue formation, and in time a restorative reconstruction in case the tissues of the organ concerned are found to be in a morbid or diseased condition.

2. The effect of a *prolonged cold* application is to cause continuous contraction of the vessels of the internally related part so long as cutaneous sensibility is maintained; but when the application is so intense or prolonged as to destroy the sensibility of the skin, the reflex action ceases, and stimulation of the vasomotor centers no longer exists; hence, the vessels of the related internal vascular area relax. Thus a cold application, if too prolonged or too intense, may defeat its own purpose, producing an effect the very opposite to that intended. This interesting fact seems to be little known, or at least little regarded, if one may judge from the loose way in which instructions are given for the use of cold applications to the skin for relief of internal congestions and inflammations.

The reflex stimulation of cold may be maintained by removal of the application for 3 to 5 minutes every 20 to 30 minutes, the parts being well rubbed with warm, dry flannel in the interval, or heat may be directly applied for 2 or 3 minutes.

The effect of prolonged cold application, made in the manner suggested, is to lessen the blood supply of an internal viscus. This may sometimes be desirable, but is certainly far less often needed than is generally supposed. Injury does not result so much from the excess of blood in a part as from stagnation of blood. The blood is the chief healing agency in the body. It can not too often be reiterated—*it is the blood that heals*. Hence the aim should be to increase the supply of fresh blood to a part by encouraging the movement of blood through it, rather than to lessen the volume or the activity of the blood current.

While a cold application causes contraction of the vessels of the related viscus, the contraction of the cutaneous vessels may tend to fill the vessels of the part, if there exists collateral relation of the cutaneous and visceral vessels involved. The actual effect produced will depend upon the relative activity of the two forces. Care must be taken to ar-

range the compress in such a way as to avoid antagonistic effects of this sort. For example: In making cold applications to relieve cerebral congestion, the cold application should include the neck, so as to cause contraction of the main supplying trunks, thus preventing the collateral hyperemia of the brain, which may be easily induced by cold applications to the face or forehead only, a very common fault.

In certain cases the effect of cold applications may be to increase internal congestion to such a degree as to make this the dominant effect, thus constituting a contraindication. A good illustration of this is seen in the case of the eye. A cold compress contracts the supraorbital artery, thus increasing the blood supply of the eyeball to which the collateral branch is distributed. For this reason the fomentation rather than the cold compress is indicated in inflammation of the eyeball. But the application must not be so prolonged as to heat the eyeball itself, thus dilating its vessels. In most cases, inflammation of the lids is better relieved by short, very hot applications than by prolonged cold compresses. If cold compresses are used, they should be very small, not larger than the eye socket, and care should be taken that they do not extend above the brow.

3. The proximal cold compress controls local blood supply by contracting the supplying arterial trunk. This procedure is of special value in the treatment of congestion of the head, a cold compress, ice-collar, or ice-bag being applied to the neck. An ice-bag to the back of the neck contracts the ventral arteries; cold applied to the sides or front contracts the carotids. The proximal compress is of greatest value associated with the fomentation applied derivatively in the treatment of cerebral congestion or inflammation of the pharynx, nasal cavity, or middle or internal ear.

4. If the cold application is permitted to accumulate heat sufficiently to allow partial reaction to occur, being renewed only at intervals of 10 to 40 minutes, or when it has become warm, a still different effect is produced. At the first application of the cold, the blood vessels are made to contract, thus forcing out of the diseased organ the accumulated and poison-laden blood. The lymph vessels share in the contraction, and likewise the muscular elements of the capsule and other structures. Thus the organ is well squeezed, so to speak, as one might compress a wet sponge in the hand. The germ-laden leucocytes are sent on their way to the spleen or other parts for repair or destruction, while a new supply of these most valiant and important body defenders is later brought into the part. As the compress warms up, internal as well as external reaction takes place, the vessels dilate, their rhythmical pumping is stimulated, and thus the introduction of a fresh and vital supply of blood is effected. By this means leucocytosis is encouraged, and the supply of fresh leucocytes is constantly renewed, just as a wise general continually brings against the enemy fresh relays of soldiers, retiring those whc are worn out by the combat, and thus maintaining a vigorous fight.

From the foregoing it will be seen that the *frequently renewed heating compress* has characteristic properties which commend it for use in specific inflammations of deeply seated parts, as in pneumonia, hepatitis, gastritis, pelvic and other internal inflammations.

It may be further remarked in relation to this form of partial application, that *by permitting sufficient reaction to maintain an active cutaneous circulation, an excellent derivative effect is produced*, the value of which is often overlooked.

5. By *alternate hot and cold* applications to a limited cutaneous area, a most active fluxion of blood through an associated internal part may be produced;

and this effect may be many times repeated, by reason of the constant renewal of the sensibility of the skin surface by the hot applications, thus maintaining a high degree of reflex activity. The frequent change from heat to cold (every 15 seconds) powerfully excites the nerve centers in charge of the parts, and thus the nerve supply; hence this form of application is contraindicated by pain or acute inflammation.

Each application of cold causes instant contraction of the associated visceral vessels. Each application of heat instantly restores the normal temperature of the skin, and terminates the reflex effect of the cold. Thus the organ is alternately emptied and filled, much as a sponge may be squeezed and filled, and this may be accomplished almost as rapidly as the compresses can be applied, and may be continued indefinitely,—a veritable pumping process by which blood may be passed through any internal organ, a genuine vasomotor gymnastics, applicable to a multitude of acute and chronic conditions.

On the other hand, an application so capable of exciting both vascular and nervous activity is especially adapted to cases of passive congestion, chronic exudates, and atonic and indolent states, such as malarial enlargement of the liver and spleen, rheumatic joints, serous and fibrinous exudates in the chest, muscles, or joints.

6. *Very hot* applications produce internal vascular effects somewhat similar to those of cold applications, but the contraction is briefer in duration, and occurs only when the application is sufficiently hot to cause pain, and to induce contraction of the cutaneous vessels. The contraction of the cutaneous vessels quickly gives way to dilatation, especially of the veins, because of the direct influence of the heat upon the sympathetic ganglia of the small vessels; but the stimulation of the vasomotor centers continues as long as the temperature of the application is sufficiently high to excite pain, and thus the influence upon the reflexly related parts is much more prolonged. It must be remembered, however, that the application of heat to large surfaces, or over the heart, has the effect to excite the action of the heart, which is usually undesirable. Hot applications for purely local effects should not be larger than necessary to produce the desired effect.

7. A *warm* or *neutral* compress is soothing in its effects. This fact is due to the shutting off from the internal related viscus of all external stimuli. It is by these stimuli, chiefly thermic in character, that the vascular tone and functional activity of the internal parts is maintained. These vital conditions are, at least in very great measure, dependent upon the fusillade of sensory impressions constantly playing upon the spinal and cerebral centers. When these impressions become too intense, or the nerve centers abnormally sensitive, the phenomena of irritation appear — pain, spasm, hyperesthesia, etc. Neutral applications protect the skin against external irritants. This explains the soothing effect of the poultice. It must be remembered, however, that a warm compress, when applied across an arterial trunk, has the effect to dilate the vessel, and thus to increase the column of blood flowing into the parts supplied by it; hence the fullness in the head, and the discomfort resulting from too warm clothing of the neck.

8. *Moderately hot* applications generally produce congestion of the associated vascular areas. It is thus that a warm hip or foot bath encourages the menstrual flow, and the heating abdominal compress fills the portal circulation with blood, and thus relieves the brain. The fomentation and the heating compress are the most important partial measures for accumulating or concentrating blood in parts in which such an effect is desirable

either to combat a local anemia or to produce a derivative effect in favor of some remote or associated part, though many other procedures are of great service in special cases.

9. By means of the prolonged *heating compress* it is possible permanently to increase the volume of blood in a part, thus lessening the volume of blood in some collaterally related area. For example: The heating compress to the abdomen not only distends with blood the cutaneous vessels, but also the portal circulation, thus drawing away from the brain or lungs a considerable amount of blood, and relieving an existing congestion, either active or passive. (*a*) When the effect desired is increased volume of blood in a given part, for the purpose of producing anemia in some proximate or remote part, the wet towel should be protected not only by flannel, but also by rubber cloth or other impervious material. This purpose is to retain as much heat as possible, so as to secure the fullest dilatation of the cutaneous vessels. (*b*) When it is desired to increase the movement of blood in a reflexly related part, while at the same time combating stagnation or passive congestion, a compress covered only with flannel should be employed, so that by the limited but constant evaporation taking place, there may be maintained an active congestion of the skin and related parts, with derivative effect, and at the same time a vigorous fluxion in the reflexly related viscus, and a stimulation or energizing of the nerve supply to the part, and of all those vital activities whereby disease processes are opposed and the integrity of the body conserved.

10. *The hot and cold compress* produces remarkable effects by combining derivative and reflex effects. For example, (*a*) a fomentation to the upper back diverts blood from the bronchial vessels, while cold simultaneously applied to the front of the chest contracts the same vessels by reflex influence, thus intensifying the effect. (*b*) Cold over the sternum, with a fomentation over the lumbar region, relieves congestion of the kidneys in the same way by diverting blood into the cutaneous branches of the lumbar arteries, while contracting the renal vessels. (*c*) The pelvic circulation is controlled by a cold bag over the hypogastrium in conjunction with a pelvic pack. (*d*) To relieve congestion of the liver, stomach, spleen, or pancreas, the application must be reversed, the heat being applied to the anterior surface and the cold application behind; or the heating compress may be applied to the whole trunk, thus acting derivatively upon the whole portal system, while the strong collateral hyperemia of the internal mammary produced by the fomentation aids in localizing the effect upon the part affected. (*e*) The intestines are best influenced by the use of the cold abdominal compress combined with the fomentation over the lumbar region.

(11) *The hot and cold pack* consists in a fomentation combined with a heating compress or partial pack. The action differs from that of the hot and cold compress in that the principal action is a remarkable derivative effect through drainage of the veins of the affected part by the passive hyperemia induced by the heating compress, while at the same time blood is diverted from the arteries by the dilatation of the collaterally related arteries by means of the fomentation. The hot and cold pack strongly influences both the arteries and the veins of a part. It is, perhaps, our most powerful derivative procedure, its effects being almost wholly derivative in character, while the hot and cold compress concerns chiefly the arteries, which it influences both reflexly and derivatively.

REVIEWS.

ESSENTIALS OF SURGERY: TOGETHER WITH A FULL DESCRIPTION OF THE HANDKERCHIEF AND ROLLER BANDAGE.— Arranged in the form of questions and answers prepared especially for students of medicine.— By Edward Martin, A. M., M. D., Clinical Professor of Genito-urinary Diseases in the University of Pennsylvania. Illustrated, seventh edition, revised and enlarged, with an appendix containing full directions and prescriptions for the preparation of the various materials used in antiseptic surgery, also several hundred recipes covering the medical treatment of surgical affections. W. B. Saunders, publisher, 925 Walnut Street, Philadelphia. 1900. Price, $1.00, net.

The fact that so many editions of this valuable work have been issued is sufficient evidence of its merit. This edition (the seventh) has been thoroughly revised, and contains the leading facts pertaining to the essentials of surgery. A section on the modern treatment of appendicitis has been inserted, which adds materially to the value of the work. In this work the student will find great assistance in preparing for examination.

R. V. WAGNER & CO. have just issued a booklet in colors, descriptive of the Mica Plate Static Machine. In it they make quite a number of startling statements and claims, which, if true, would indicate that the Mica Plate Static Machine is a long way in advance of all others. "Five sparks now grow where one spark grew before" is one of their headlines, and refers to the fact that by reason of the increased speed of their machine, they produce a volume of current five times that produced by any other static machine of the same size. They also state that for the best X-ray work, you must have, in addition to large volume, a high vibratory current, which you can generate only on a machine revolved with great velocity. "An ounce of prevention is worth a pound of cure," a page showing a skiagraph of a poorly set forearm, is a whole book on the advantages of an X-ray outfit. It will pay you, if interested in X-ray work, to send for this booklet.

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W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR APRIL.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
103 per cent.	2	1	3
100 " "	79	49	*128
98 " "	5	5	10
95 " "	5	8	13
93 " "	3	6	9
91 " "			
88 " "	3	4	7
85 " "	2	3	5
83 " "		3	3
78 " "		3	3
71 " "		3	3
Below 70	2	1	3
Total	101	86	187

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	43	17	60
Between 4,500,000 and 5,000,000	25	21	46
" 4,000,000 " 4,500,000	22	22	44
" 3,500,000 " 4,000,000	6	16	22
" 3,000,000 " 3,500,000	2	8	10
" 2,500,000 " 3,000,000			
Below 2,500,000	3	2	5
Total	101	86	187

Examination of Sputum. — There were 48 examinations made, 40 being new cases. Tubercle bacilli were found in 6 cases.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	22	73	9	82	34	53	65	62
Less than 10,000 bac	6	20	1	9	9	14	16	15
Between 10,000 and 100,000 bac.	2	7			8	13	10	10
More than 100,000 bac.			1	9	13	20	14	14
Total	30	100	11	100	64	100	105	100

The patients were received from the following States and countries: Michigan, 20; Illinois, 12; Ohio, 11; Wisconsin, 10; Indiana, 9; Iowa, 7; Ontario, 7; New York, 4; Pennsylvania, 3; Nebraska, 2; California, 2; Canada, 2; Minnesota, 2; Honduras, 2; Arkansas, 1; Kentucky, 1; Colorado, 1; Missouri, 1; West Virginia, 1; Vermont, 1; Massachusetts, 1; Alabama, 1; India, 1; unclassified, 3. Total, 105.

Urinary Laboratory.— Total number of specimens examined, 579; number of new cases, 258; number of cases having albumin, 25; casts, 13; sugar, 6; pus, 69; blood, 10.

PUBLISHERS' DEPARTMENT.

THE Forty-seventh Sanitary Convention will be held at Alma, Mich., under the auspices of the State Board of Health, Thursday and Friday, June 7 and 8, 1900, Rev. Dr. A. F. Bruske, President, Dr. G. J. Sweetland, Jr., Secretary. There will be sessions the first day at 3:00 and 7:30 P. M.; on the second day at 2:30 and 7:30 P. M., standard time. At each session there will be addresses or papers on subjects of general interest pertaining to public health, each paper to be followed by a discussion.

The objects of the Convention are the presentation of facts, the comparison of views, and the discussion of practical methods relating to the prevention of sickness and death, and the improvement of the conditions of living. This is not a medical convention, but it is for the people generally.

AMERICAN CONGRESS OF TUBERCULOSIS.— The March number of the *Medico-Legal Journal*, New York, contains a number of papers contributed to the American Congress of Tuberculosis, held in New York in February, 1900, including a short paper by Dr. Baker, Secretary of the Michigan State Board of Health, entitled "Communicability and Restriction of Consumption." The complete proceedings of the "Congress" are to be published; price, three dollars. To be obtained of Clark Bell, President Medico-Legal Society, 39 Broadway, New York.

PNEUMONIA IN MICHIGAN.—According to a recent report sent out by the Secretary of the Michigan State Board of Health, sickness from pneumonia during the month of April was one third less than the average for the fourteen preceding years.

MODERN MEDICINE

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ORIGINAL ARTICLES.

ELECTRICITY AS A COMPLEMENT TO HYDROTHERAPY IN THE TREATMENT OF CHRONIC DISEASE.[1]

BY J. H. KELLOGG, M. D.,
Superintendent of the Battle Creek (Mich.) Sanitarium.

WHILE electricity is recognized as one of the most remarkable and powerful of all the forces of nature, and while laboratory experiment and clinical observation have demonstrated beyond chance for cavil its great potency as a therapeutic agent, all attempts to secure for it the standing of a universal remedy, an agent capable of accomplishing all that needs to be done for the sick man in the way of remedial effort, have signally failed. It may be further added perhaps without injustice that the efforts of some enthusiasts to find in electricity a panacea for all human ailments, have been a fruitful cause of prejudice; and the failure of this agent to accomplish all that has been claimed for it in the hands of those who have been led to make a trial of it, has led a vast number of physicians to return to the empirical, irrational, and artificial methods, the legacy which has come down to us from the infantile days of our beneficent art, or which were engrafted upon it during the ages when all the arts and sciences were stifled by the universal prevalence of superstition and intellectual darkness,— methods which still cling to us like the barnacles upon the bottom of an ocean steamer, and hinder our advancement toward the goal of all scientific progress in medicine,— the attainment of a system of dealing with the sick in which every measure employed and every application shall have for its basis a thoroughly rational and physiological foundation. No medical practice can properly claim to be strictly rational which is not at the same time physiological. Those measures which accomplish so-called therapeutic results by means of toxic effects are pathological rather than physiological agents, and with the onward march of laboratory research, clinical observation and physiological and pathological knowledge must in time be wholly eliminated from our therapeu tic armamentarium. The writer has for more than twenty-five years given special and earnest study to the practical application of physiological agents of all sorts in the treatment of disease. Water, gymnastics, massage, manual and mechanical exercise, heat, sunlight, diet, and other agents, as well as electricity in its various forms, have been carefully studied and utilized in the treatment of all forms of acute and chronic disorders. Relying upon none of these agents as a cure-all, the effort has been so to combine them all as to secure for each the greatest possible efficiency, utilizing each one for those things to which it is best adapted, and applying two or more in succession or simultaneously in such a way as to enable the effects of each one to supplement or complement the effects of each other one. Special studies have been given to the utilization of water and electricity in this way, for the reason that these two agents have been the object of more exact scientific study and research than any other of the agents employed in physiological therapeutics.

The purpose of this paper is to record some of the practical deductions and observations which I have made, not for the purpose of depreciating the value of electricity, but for the purpose of understanding, if possible, its utility by enlarging its sphere of usefulness and increasing its efficiency. The chronic invalid rarely has a fair chance unless he can have brought to bear upon his case simultaneously all the various physiological agents which are indicated. To undertake to cure a chronic dyspeptic by diet alone,

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or water alone, or by electricity or exercise alone, or by any other single agent, is very much like trying to raise a big city block with one jackscrew. All the lifting agencies possible must be set at work to get these chronic sufferers out of their pathological ruts.

It requires but a very superficial study of the subject of hydrotherapy to show the remarkable similarity between its method of effecting results and that of electricity. The most important results of each are attained through their influence upon the nervous system, as the therapeutic effects of water, as well as those of electricity, are based upon its physiological effects.

The researches of Schüller, Vinaj, Winternitz, and others have shown that prolonged, moderately cold applications to the surface produce prolonged contraction and decongestion of internal vascular areas reflexly connected with the cutaneous area acted upon. Local cold applications in this respect differ from general cold applications, which cause dilatation of the visceral and cerebral vessels by mechanical displacement of the blood resulting from the contraction of the surface vessels.

Warm applications, that is, a temperature of 92°–98°, on the other hand, cause immediate contraction of the vessels of the interior of the body corresponding with dilatation of the cutaneous vessels.

Every portion of the cutaneous surface is reflexly associated with some internal vascular area, the conditions of which may be controlled by the application to the associated cutaneous area of thermic or other agents capable of producing vascular changes; for example, any agent which causes contraction of the cutaneous vessels will cause a corresponding contraction of the associated visceral vascular area, this being also true respecting vasodilatation.

From clinical observations which I have made, and from the study of practical electrotherapy in connection with hydriatry, or rational hydrotherapy, I am fully convinced that many of the effects of percutaneous applications of electricity are produced by the same means that many hydriatic effects are obtained; *viz.*, through sensory impulses propagated from the skin to the spinal cord through the sensory nerves, and sent out from the spine as motor influences, carried along through the nonmedullated vasoconstricting fibers of the sympathetic and the medullated inhibitory fibers which pass directly from the vasomotor centers of the cord to their distribution in the vessels. In other words, I believe that the condition established in the skin under the influence of electrical stimulation is propagated through the reflex arc and referred to the associated internal vascular area. It seems to me that this view alone affords a rational explanation of the influence of percutaneous applications of galvanism upon internal congestions. We know that uterine congestion may be relieved by electrical applications of various sorts. A galvanic current of twenty to forty milliamperes, applied, the cathodal electrode over the epigastric region, the anode over the lumbar region, produces decided effects in relieving uterine and ovarian congestion. Yet the location of these organs is such as to bring them practically at the neutral point between the two poles, and hence outside the sphere of influence of either the cathode or the anode. It is true that by increasing the strength of the current the neutral point may be moved nearer to the anode, while decreasing the current moves the neutral point nearer the cathode, thus bringing in either case a larger area under the influence of the opposite pole; and knowing this fact and taking advantage of it, we may bring under the influence of either pole desired, structures not too far removed from the surface. But in the case of organs located approximately in the center of the body or far beneath the surface, as the case of the uterus, the ovaries, the abdominal viscera in general, and the spinal cord, it is evident that we are powerless to produce in them an electrotonic condition of any considerable degree of intensity. In the case of the pelvic organs, likewise in the case of the stomach, we are able to produce either anelectrotonus or catelectrotonus, as we may desire, by means of suitable electrodes; but in the case of the spinal cord, the sympathetic ganglia, most of the abdominal viscera, and indeed we may say nearly all the deeply seated structures of the body, we are unable to produce electrotonic states, for the reason that the action of the electrical currents when applied to the body is chiefly confined to the immediate vicinity of the electrodes. As the

current leaves the electrodes, it spreads out, utilizing the whole body as a conductor, instead of passing directly from one electrode to the other, as might be supposed by one not familiar with the laws of electro-physics.

These and other considerations have fully persuaded me that in explaining the effects of percutaneous applications of electricity, we must keep in mind the interesting anatomical and physiological relationships which form the basis of a large share of the applications of water in rational hydrotherapy.

The researches of Brown-Sequard, Charcot, Winternitz, Beni-Barde, Fleury, and other hydriatrists have established a distinct reflex relationship between the following-named external and internal regions respectively : —

The scalp and skin covering the neck, upper part of back, and face, with the brain.

The precordial region, with the heart.

The skin covering the chest, with the lungs.

The middle dorsal region and epigastric region, with the stomach.

The lower third of the sternum and lumbar region, with the kidneys.

The skin overlying the liver and spleen, with these organs.

The umbilical region, with the intestines and sympathetic ganglia.

The epigastric, the lower lumbar and sacral region, the inner surface of the thighs, and the feet, with the uterus and ovaries.

In ge neral, the skin overlying an internal organ is reflexly associated with it. This is the reason why percutaneous applications of electricity made over an organ usually influence it, and not altogether because the electrical current is passed through the organ.

For nearly twenty years I have made use of this principle in the application of electricity, especially in the treatment of genitourinary diseases, and have seen excellent results from the application. For example, in applications intended to influence the genital glands and associated organs,— the uterus, ovaries, and tubes in women, the testicles and prostate in men,— I have found it distinctly advantageous to make applications to the inner surface of the thighs and perineum as well as to the epigastric and lumbar regions. I was first led to do this because of the anatomical relations of the nerve supply of these regions, before the reflex relationship between cutaneous and visceral vascular areas was so thoroughly understood as at present. I have also for many years utilized anodic applications of the galvanic current to the face as a means of relieving coryza, and have often seen a patient relieved of headache, presumably congestive in character, by applications of this current.

Granting the truth of the above statements respecting the mode of action of percutaneous applications of electricity upon visceral circles, it needs no lengthy argument to show the great advantage of combining electrical and hydriatric applications in a great variety of morbid conditions.

According to my personal experience, two general rules may be established for applications of this sort: —

1. Increased movement of blood and accelerated functional activity of an internal organ may be induced by a short vigorous cold application in combination with a cathodic application of the galvanic current. This electrical application may be either simultaneous or may immediately follow the cold application. Bipolar, faradic, or sinusoidal currents may also be applied with advantage, but the effect is less distinct than that of the galvanic current. The electrical application should be as strong as the patient can bear without pain, and should be given with large electrodes.

2. The movement of the blood, congestion, and undue functional activity of an internal organ, may be diminished by a prolonged moderately cold application (60°–70°, from thirty minutes to several hours), combined with the simultaneous anodic application of the galvanic current of moderate strength.

By the application of these principles, results which appear really marvelous to one not familiar with applications of this sort may be obtained in cases of congestion of the brain, lungs, liver, uterus, ovaries, likewise in atonic conditions of the stomach, bowels, in amenorrhea and hypopepsia.

In applications for the relief of pain, in which electricity so often renders most valuable service, the association of heat is an exceedingly valuable measure. When the pain is neuralgic in character, a strong application of the sinusoidal

or faradic current, combined with a fomentation at a temperature high enough to produce slight pain when first applied, continued for fifteen or twenty minutes, gives very positive and gratifying results. The current should be as strong as the patient will bear. When the pain is due to congestion or inflammation, an anodic application of the galvanic current should be employed instead of an induction current. The application should be prolonged and not so strong as to produce decided sensation.

Anodic galvanic applications may likewise be associated with cold as an analgesic measure.

In cases of cardiac insufficiency in which the application of electricity may be thought a useful measure, advantage may be obtained by the application, two or three times daily, of a cold compress for forty to sixty minutes, over the anterior surface of the chest. Slowing of the pulse and an increase in arterial tension, as indicated by sphygmographic tracing, will indicate at once the therapeutic power of this simple application.

In cases of atony of the bladder, and inactivity of the bowels due to dilatation of the colon, the cold douche to the feet and over the lumbar, umbilical, and hypogastric regions, in combination with faradic and sinusoidal applications to the rectum and abdominal walls, achieves prompt success in many most obstinate cases which have failed to yield to other measures. Cold douches applied to the parts named may also be used to advantage in combination with the galvanic current applied simultaneously with the abdominal and lumbar. The strength of the current should be 60 to 80 milliamperes, the application being made by means of a smoothly fitting electrode.

In cases of apepsia and hypopepsia, in which hydrochloric acid is absent or greatly deficient in quantity, most excellent results may be obtained by the application of the cathodic galvanic or the sinusoidal current applied to the epigastriumin combination with the ice-bag for half an hour before each meal.

Painful congestion is relieved by very hot fomentations applied for half an hour after a meal in combination with the faradic or sinusoidal current of moderate strength.

Very short, very hot applications over the liver (130°–140°, for five to eight minutes), combined with prolonged anodic galvanic applications, act powerfully in relieving hepatic congestion.

A very hot fomentation over the lumbar region, combined with anodic galvanic application to the same parts and to the lower third of the sternum, is indicated in renal congestion.

The hemostatic effects obtainable by hydriatric applications in combination with the galvanic current I have found of invaluable service in hemorrhage due to ovarian congestion, intrauterine vegetations, and intrauterine and submucous and intestinal fibroids of the uterus. In cases in which persistent hemorrhage follows the employment of electrolysis, the cold pelvic pack and the hot vaginal douche in many cases render continuation of the treatment possible when otherwise its interruption would be necessary.

In amenorrhea the effects of cathodic and anodic or sinusoidal applications to the uterus are greatly increased by short cold applications to the lumbar region, the inner surface of the thighs, and the feet.

In applications of electricity to paralyzed and paretic muscles, the effects of the electrical application may be greatly increased by the previous application of cold water in the form of the ordinary cold douche, the percussion douche, the Scotch douche, or cold friction, or by the heating compress. The marked increase of muscular irritability produced by hydriatric applications of this sort increases the susceptibility of muscle to the influence of the electrical current, whether the galvanic, faradic, or sinusoidal current be employed.

For the relief of pain in neuralgic joints, hot applications accompanied or followed by the sinusoidal or the galvanic current are a most useful measure in cases in which joints are not painful or stiffened or thickened by inflammatory products. The alternate hot and cold douche and other exciting hydriatric measures may with much advantage be employed in connection with cataphoresis. I have found this combination exceedingly useful in treating many cases of this sort.

In chronic congestion of the pelvic and abdominal viscera, the good effects obtained from local electrical applications, either internal or percutaneous, may be continued and intensified by the use of the heating compress, consisting of a

towel wrung dry out of very cold water, placed over the parts and covered with several thicknesses of flannel, sufficient to maintain the heat produced by reaction, but without excessive accumulation of heat.

Faradic, sinusoidal, and cathodic galvanic applications may be employed in connection with the revulsive douche and other revulsive applications in all cases in which pain is not a marked feature, but in which the purpose is to produce strong circulatory reaction. When pain is present, the faradic or sinusoidal current should not be employed, and the anode instead of the cathode of the galvanic current should be employed.

The form of revulsive applications referred to consists of a prolonged hot application followed by an exceedingly short cold application. The respective times of the applications may be: hot, five to fifteen minutes; cold, fifteen to thirty seconds. If compresses are employed, three to five minutes for the hot douche, followed by a cold douche for four to ten seconds.

For general hypnotic effects applicable to nearly all cases of insomnia, a neutral bath, that is, a bath at a temperature of 92°–96°, for thirty to forty minutes, or a douche with little pressure at the same temperature, with a duration of one to five minutes, almost invariably succeeds in securing sound sleep without the use of hypnotic drugs of any sort, especially when combined with the static insulation and breeze to the head and spine, or a galvanic application to the inferior cervical sympathetic and solar plexuses, the anode being placed at the neck. This application rarely fails to secure sleep, provided proper attention is given to the diet and other matters of hygiene.

The neutral full bath, combined with the galvanic, faradic, or sinusoidal current, is perhaps the most powerful of all hypnotic measures. I have employed this bath with success for nearly twenty-five years, and it has rendered valuable service, not only in relieving insomnia, but in helping patients through the trying hours which immediately follow the withdrawal of opium, cocain, and other drugs, in the treatment of various forms of drug addiction.

The faradic, sinusoidal, and static of high frequency currents are all of a tonic character, stimulating metabolism, arousing the nerve centers, and directly exciting the brain and all portions of the central nervous system.

Short applications of cold water, especially when accompanied by strong mechanical effects, as in the cold douche, are the most powerful of all known tonics. By combination of the cold douche with the faradic and sinusoidal electrical currents, the tonic effects of each measure are intensified. The electrical application should be made immediately after the douche, or soon after the douche, when reaction is well established.

The most powerful of all tonic applications of water is the percussion douche. Applied to the spine especially, this powerful hydriatric procedure awakens the whole nervous system in a most remarkable manner, and prepares it to receive the greatest possible benefit from applications of electricity which may follow, such as general faradization, general applications of the sinusoidal current, the static charge, etc.

It requires but a cursory review of these physiological effects to note the remarkable parallelism between the effects of hydriatric applications and the effects produced by electricity. With equal readiness it may be seen how by the simultaneous or successive use of electricity and water, if applied with scientific precision, these two potent agents may be able to render mutual aid in a great variety of conditions.

Special note may be made of the following points in which such a useful association is suggested: Water moistens the skin, and thus increases conductivity. Hot applications cause immediate dilatation of the blood vessels, increasing the vascularity of the skin, and thus also increasing its electrical conductivity, while cold water causes at first a contraction of the small vessels, lessening the blood supply of the skin, diminishing its conductivity for both heat and electricity. In the reaction which follows, however, the amount of blood in the skin is greatly increased, thereby lessening its resistance. Both very cold and very hot applications to the skin diminish nerve sensibility, and thereby increase the tolerance to the electrical current. Anemia of the skin, on the other hand, increases sensibility, while saturation of the skin with moisture diminishes irritability and nerve sensibility.

Steiner showed that temperatures below 59° and above 77° lessened the velocity with which nerve impulses are conducted, while Hermann has shown that the application of cold diminishes notably the phenomena of electrotonus. Heat, being primarily excitant, produces effects analogous to the cathode, while cold, being primarily sedative, produces effects anodic in character. Neutral applications are likewise sedative, thus resembling the anode in their effects. Short cold applications, because of the reactionary excitation produced, occasion effects resembling the cathode's influence of the galvanic current or the excitation of the faradic, while the atonic reaction which follows a prolonged hot application results in sedative effects similar to those of the anode.

I might enlarge at considerable length upon the subject I have introduced, but have, I think, described a sufficient number of applications to illustrate the principles which it was my purpose and object to set forth. I am especially interested in the development of that portion of our so-called medical science which alone rests upon a sound and rational basis, namely, physiological therapeutics. It is this interest which leads me to wish to continue as a member of this society, and I trust that some time not too distant in the future we may have in this country a medical association which shall be devoted not alone to the application of a single remedial agent, but which shall study to elucidate the principles and methods relating to all classes of physiological remedial agents, chief among which will be found electricity, water, light in its larger sense, and all physical agents capable of influencing the human organism.

Death Caused by Tubercle Bacilli in Books.— According to the State board of health of Michigan, twenty clerks in that State, who were working over volumes of records, were taken ill with consumption and died. A bacteriological investigation of the books showed them to be full of tubercle bacilli. The infection is thought to have come from a clerk who had consumption, and who was in the habit of moistening his thumb with saliva when he turned the page.

A REPORT OF TWO SEVERE CASES OF CARDIAC DROPSY SUCCESSFULLY TREATED BY REST, TONIC HYDROTHERAPY, MASSAGE, ELECTRICITY, AND REGULATION OF DIET.

BY DR. W. H. RILEY, M. D.,

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CASE I.

MR. M., of Colorado, came to the Colorado Sanitarium April 17, 1899, and gave the following history: Age, forty-two years; married. His family history is negative. At the age of thirteen he had an attack of inflammatory rheumatism, which affected nearly all the large joints of his body. Ten years later he had another attack of inflammatory rheumatism. These two attacks were quite severe, and lasted for several weeks. Three years after the second attack he had a third attack, which, according to his statement, was accompanied by what he termed "mountain fever" and "chronic diarrhea." During the first attack, at the age of thirteen, he was residing in an Eastern State. The last two attacks occurred during his residence in Colorado. The third attack occurred about seven years previously to the development of the symptoms of dropsy. For several years after the last attack of rheumatism, he traveled in high altitude and mountainous regions, subjecting himself to irregularities in living and to exposures of various kinds, and during this period of his life he had frequent trouble with palpitation and irregular action of the heart. For several years previously to the development of symptoms of general dropsy and heart trouble, he had more or less trouble with indigestion and disturbances of the functions of the stomach, bowels, and liver.

His health continued to fail until the summer of 1898, when he was obliged to give up his professional duties as a superintendent and inspector of mines, and was advised by his physician to take a trip to California for his health. In the fall of 1898, when in California, he noticed that his clothes were tight about his body, and that his abdomen was swollen. He also had quite a troublesome cough at this time, which he attributed to bronchitis. He remained in California some

months, returning home in the spring of the next year. By this time he had marked symptoms of organic heart disease, with incompetency, distended abdomen, cough, and other symptoms.

According to the patient's statement, it was not until this time that his physicians subjected him to a careful physical examination, and found his trouble to be an organic valvular lesion. During a part of the winter and spring of 1899 he was under the constant medical care of two or more physicians at his home, and had examinations and counsel by different medical experts from distant cities. He continued gradually to grow worse, and his medical advisers gave up all hopes of his recovery, and told his friends he would probably live but a few days.

At this point the patient determined to make another effort to regain his health, and came to the Colorado Sanitarium. We found his condition critical in the extreme. His respirations were very rapid and shallow. There was marked cyanosis of the face and extremities. The abdomen was greatly distended with fluid, and the legs were swollen and edematous. He was extremely weak, and unable to stand or walk. His pulse was 180 per minute, very irregular in rhythm, and in force weak and compressible. He also had frequent spells of vomiting. He coughed, and expectorated blood. He was exceedingly nervous, and unable to recline in a horizontal position. His sleep was broken and restless. It did not seem to me that the patient could live many days; in fact, I had doubts of his living through the first night.

A physical examination showed the following conditions: The apex beat was displaced downward to the left. There was also visible pulsation at the base of the heart. On palpation, the apex beat could be felt below its normal position, and to the left of the mammary line. On percussion the area of cardiac dullness was found to be increased, and to extend to the left downward from the normal position. On auscultation there was heard a blowing sound. This was most distinct at the apex, and in time occupied the place of the first sound of the heart. This sound was transmitted backward and behind, between the lower angle of the scapula and the spine. It was also heard over the left base of the heart, and was transmitted outward to the left axilla. It was heard most distinctly, however, at the apex. There was heard, also, a blowing sound over the ensiform cartilage, which indicated relative insufficiency of the tricuspid valve. There were physical signs of congestion and partial consolidation of the lower lobe of the right lung. The liver was enlarged and congested, especially the left lobe, and extended some distance below the lower border of the ribs. There was dullness and flatness on percussion over the abdomen as high as one inch above the umbilicus when the patient was in a sitting position. The legs were also swollen, and there was anasarca over the body generally. The patient passed only 425 cc. of urine in twenty-four hours, which had a specific gravity of 1.030, a strong odor, and a heavy reddish deposit, indicating the presence of uric acid and urates. Chemical and microscopical analysis showed the presence of uric-acid crystals, and urates in abundance, also a large amount of albumin. The patient's temperature was normal, or slightly subnormal, and there was nothing that indicated any tubercular trouble of the lungs.

The treatment of the case consisted of,—

First, rest in bed.

Second, regulation of the diet.

Third, hydriatic procedures, such as the cold friction bath at a temperature of 60° F., cold wet-sheet rubs at a temperature of from 70° to 75°, a cold shower bath at a temperature of 70°, with friction. One or more of these were used twice daily in connection with other treatment.

Fourth, massage, which was given daily.

Fifth, the use of the faradic current to the muscles daily.

As the patient had had the benefit of drug medication under competent physicians for some months before coming to the Sanitarium, it was not thought best to continue their use in connection with the remedies above mentioned, except a few times during the first week of treatment, when at times the action of the heart seemed extremely weak and irregular, and then digitalis was used. The patient's bowels were kept moderately loose by the use of salines, cathartics, and enemas, but purging was not resorted to to reduce dropsy.

Under these remedies in a short time the patient began to improve. The im-

provement continued, and at the end of a month the following note, taken from the report of the case, shows the condition of the patient: "Mr. M. is getting along very well. His heart's action is much better and stronger. His pulse is reduced from 180, when he came, to 70 at the present time. His breathing is less rapid and more regular; his appetite is good, and digestion very much improved. The dropsy in the abdomen and legs is somewhat reduced, but still troublesome." One week later, or five weeks from the time he began treatment, the following note is reported in the record of his case: "The improvement noted above has continued up to the present, and in addition there has been a decided disappearance of the dropsy. The patient passes from three to five pints of urine daily, but it contains no albumin or casts. The patient is improving in every way."

At this stage of the disease his treatment was changed, and more heroic remedies were used, such as the cold wet-sheet rub, the cold shower bath, and passive-active Swedish movements, such as are usually described under the Schott method of treatment. Two weeks later, or about seven weeks from the beginning of treatment, the report of the case states that the dropsy had all disappeared, the heart action was good, the patient was up walking about, and feeling well, sleeping well, and getting stronger. The liver was very much diminished in size, but not yet down to normal. Physical examination of the lung showed that it had cleared up some, but was not yet in normal condition.

Mr. M. remained under treatment about three months. When he left, there was no dropsy in any part of the body, the action of the heart was quite regular, the pulse was usually 70 per minute, and there were no signs of dropsy or incompetency, except that the liver was somewhat congested, and there was still slight congestion in the lower part of the right lung.

Case II.

Mrs. D., of Colorado, came to the Colorado Sanitarium Jan. 2, 1900. She gave the following history: Aged thirty-nine years; married, a housewife by occupation. She stated that her father had some heart trouble, and her mother died of dropsy. The patient was healthy as a child, but at the age of thirteen had an attack of inflammatory rheumatism. At the age of twenty-nine she had another attack, and two years later a third. These three attacks were severe, lasting for several months each time, and involving all or nearly all of the large joints of the body. Two years ago she had difficulty in breathing. She thought this was due to her heart trouble. During the past year, however, she has been quite free from this difficulty. About two years before coming to the Sanitarium she first noticed trouble with her heart. In August, 1899, she went to Denver, and for a short time seemed to improve.

Two or three months before coming to the Colorado Sanitarium she began to grow large about the abdomen, her feet began to swell, and the general dropsy increased. Her condition on arrival was as follows: There was marked abdominal dropsy, dropsy of the limbs, and general anasarca. Respiration was rapid and shallow, and the patient was unable to lie in a horizontal position on account of difficulty in breathing. She was weak, and could take only a few steps at a time. The dropsy was so pronounced in the lower limbs that the skin was broken from the pressure, the serum exuded, and two large ulcers formed on the feet as a result. Her appetite was poor. She had more or less trouble with digestion, and her bowels were constipated. Her pulse was 125 per minute, and weak, irregular, and compressible.

A physical examination of the patient showed the following signs: On inspection the apex beat was seen at the upper border of the sixth rib, and one inch to the left of the mammary line. The beat of the left auricle could also be distinctly seen in the left third intercostal space. On palpation the apex was distinctly felt at the upper border of the sixth rib, and about one inch to the left of the mammary line. A purring thrill was felt over the base of the heart in the left fourth intercostal space. On percussion, the area of cardiac dullness was found very much increased, extending below as far as the upper border of the sixth rib, and to the left beyond the mammary line. On auscultation a distinct blowing sound was heard at the apex, taking the place in time of the first sound of the heart. This blowing sound was also heard over the base of the heart, and was transmitted to the left axillary space. Behind, this sound was not heard on the left side of

the chest, but on the right side, because, the lower lobe of the right lung being partially consolidated, it transmitted sound better than the left. There were also decided physical signs of partial consolidation of the lower lobe of the right lung. The liver was also somewhat enlarged. The report of the analysis of the urine was as follows: Amount of urine passed in twenty-four hours, 260 cc.; specific gravity, 1.027; darkish red color; heavily laden with urates and phosphates; albumin present in large amount.

This patient was placed under treatment along very much the same lines as Case I. The different remedies used, as in Case I, were:—

First, rest in bed.

Second, the application of cold tonic hydriatic measures in various forms.

Third, massage.

Fourth, the application of the faradic current over the body generally. During the first few weeks of treatment the daily program of the patient was as follows: Cold friction rub, the alternate application of heat and cold to the spine in the morning. Later in the forenoon the patient had treatment again, consisting of the alternate application of heat and cold to the spine, and general faradization of the body. In the latter part of the afternoon a cold shower bath, at a temperature of 70° F., for one minute, and massage were given. Under this treatment the patient soon began to improve, and within two weeks the symptoms of dropsy began to disappear, the patient could breathe better, and the action of the heart was much improved. At this time, as the patient had now grown much stronger, the treatment was changed and made more heroic. The application of heat and cold to the spine was kept up, and passive-active movements, such as those usually given in Schott's method of treatment, were substituted three times a week in place of massage. The patient continued to improve, and in six weeks from the time of beginning treatment, the sores on the feet were nearly healed, and the dropsy had almost entirely disappeared. She continued treatment a few weeks longer with marked improvement, and at the end of three months the dropsy had entirely disappeared. She was able to walk a half mile without fatigue. The action of the heart was strong, vigorous, and regular; pulse, 70 per minute. There were still some lingering signs of congestion at the lower lobe of the right lung when treatment was discontinued.

The following measurements were taken at the beginning and close of treatment, and will indicate the severity of the dropsy in this particular case:—

Girth of ankles at beginning of treatment	14½ in.
" " " " close " "	9 in.
Circumference of calves of legs at beginning of treatment	15½ in.
Circumference of calves of legs at close of treatment	10½ in.
Circumference of thighs at beginning	35 in.
" " " " close	20 in.
" " abdomen at beginning	65 in.
" " " " close	35 in.

The patient's weight in health was 135 lbs.; when she entered the institution, 172 lbs.; when she left, 119 lbs. The difference in weight between these two dates was of course largely, if not entirely, due to the disappearance of the dropsy. The patient left the institution after a three-months' course of treatment, practically cured of the dropsy and other attending symptoms, although the organic lesions of the heart were still present.

An important part of the treatment in these cases is the regulation of the diet. With impeded circulation through the lungs and liver, the blood is forced back into the stomach, and there is present more or less passive congestion of the stomach, with catarrh and symptoms of indigestion. The patient is frequently troubled with vomiting and with flatulence. The starchy foods, as a rule, are not well digested. It is of the greatest importance in these cases that the carbohydrate elements of the food be furnished in a form that is easily digested. Starchy foods that are poorly cooked or cooked at the boiling point of water, as a rule can not be well digested. It is better to furnish the patient with food that is cooked at a higher temperature, where the starch is converted into dextrin, and in a condition in which it is readily converted into maltose, the final product of starch digestion. In treating these cases I have therefore used whole-wheat zwieback, granola, and granose, as in all these foods the starch is converted into dextrin in the process of manufacture, the foods being thus easily digested and assimilated.

It is well to bear in mind that in these cases, on account of the lower blood

pressure through the kidneys, and frequently on account of other diseased conditions of the kidneys, the amount of urine, and consequently the amount of waste matter carried off by the urine, is very much diminished, and, as we have noticed, albumin, hyalin, and granular casts are present in these cases. As the kidneys have more work to do than they can do, it seems to me that it is of the greatest importance that no more work than is necessary should be imposed, but that they should be relieved as far as possible.

In the two cases above reported, meat was entirely prohibited from the diet, for the reason that in meat, in addition to the food elements that it contains, there is also present a large amount of waste matter, that furnishes no energy to the body, and must be eliminated through the kidneys without being of any use whatever to the body. In fact, they are harmful, as they throw work upon the kidneys, and tend to irritate the kidneys when passing through them. I have found it much better to furnish the proteid and fatty foods to such patients from the vegetable kingdom. At the present time a large number of different kinds of foods are manufactured from nuts, which contain a large percentage of proteid and fat, and when properly prepared, are much more easily digested than meat. I have had occasion to make several tests of the digestibility of these different nut preparations, and I find, when subjecting them to artificial digestion and comparing them with the digestibility of meat, that the proteid in the various nut preparations is digested in from one quarter to one half the time that the proteid in meat is digested, and there is, furthermore, a larger percentage of proteid in these preparations than in meat. The oils in these foods are also very easily digested. With a diet consisting of granose, granola, whole-wheat zwieback, in which the starch is dextrinized and in a form easily digested, together with the various nut preparations which are now known by the trade names of protose, nuttolene, bromose, etc., with plenty of cooked fruits, and with the free use of cream and fresh dairy butter, I have had no trouble with symptoms of indigestion and flatulency. These foods furnish the food elements necessary to give energy to the heart and enable it to do its work.

A New Kind of Elementary Granules in Human Blood, Sputa, and Tissues.— L. Grünwald (*Centralblatt f. Innere Medicin* (Leipsic), No. 30) states that a large number of cells which have been supposed to contain merely homogeneous protoplasm are in fact filled with granules which the author calls hypeosinophilous granules. They are stained with eosin, but decolored again by acids or alkalis, and appear fuchsin red in Ehrlich's triacid stain, contrary to the usual eosinophile granules, which stain orange. The granules are encountered in the round cells of the sputa, seropurulent effusions in the pleura or pericardium, pus, and inflammatory neoplasms, also in the blood in the mononuclear or polynuclear leucocytes. —*Journal Am. Med. Asso., Sept. 2, 1899.*

Gonococci in the Blood.— Panichi (*Settimana Med.*, Aug. 26, 1899), on account of the rarity with which gonococci have been found in the blood, reports two cases of gonorrheal rheumatism in which good cultures of gonococci were obtained from the blood. In order to obtain cultures from the blood it is necessary to have good culture media and to collect the blood at the time of microbic invasion. The author used agar and human blood serum for culture media.

Cultivation of the Typhoid Bacillus from Rose Spots.—Mark W. Richardson (*Medical Record*) reports the results of six cases in which a bacteriological culture examination was made of the exanthema in typhoid fever. In five of the cases the bacilli were found from two to twelve days (the average about six) before the Widal reaction was obtained. The writer believes, therefore, that the method may be of diagnostic service.

MAXWELL and Clarke (*British Medical Journal*, Nov. 25, 1899), after a bacteriological examination of eight cases of cystitis, find that the character of the bacteria found are dependent upon the stage of the disease. When staphylococci and streptococci are at first present, they may disappear and subsequent cultures show the presence of colon bacilli.

TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

Babinski's Toe Phenomenon.— M. M. Raymond Cestan and Louis le Sourd, in the *Gazette des Hôpitaux*, Nov. 23, 1899, give a very accurate account of this phenomenon and its value as a diagnostic sign. The phenomenon is this: In a normal condition of the brain and lateral tracts of the cord, a pricking of the plantar integument induces a flexion of the toes, especially the great toes, upon the metatarsal bones. In cases of hemiplegia, or monoplegia of the leg dependent upon an organic affection of the central nervous system, when the plantar integument is pricked, the toes perform an extension movement on the metatarsal bones. This statement has been called in question by some; and it is to make the importance of the phenomenon that the authors conducted their extensive researches at the Salpêtrière and the Hospital de Paris. This toe phenomenon is never found in the normal adult. This is the testimony of Babinski, Gasne, and the authors after years of research among those affected with all sorts of nervous diseases. In seventy-five cases of hemiplegia it was present in seventy, and the toes immovable in five; in thirty-five cases of spasmodic paraplegia, it was present in all; in insular sclerosis it was found in nineteen out of twenty, and the toes were immovable to stimulation in the remaining case; in syringomyelia it was present in six out of six; in Friedreich's it was detected in ten out of ten; in thirteen cases of epilepsy it was found in two, and in these there was organic disease in the brain. In hysteria, neurasthenia, general paralysis, polyneuritis, paralysis agitans, myopathies, and atrophic paralyses there never was present the extension of the toes on the metatarsus. This goes to prove that the toe phenomenon of extension is of the utmost value in diagnosing organic disease of the brain in the motor regions and of the motor tracts in the cord. In order to reveal the sign to best advantage, the patient lies on the side, the thigh flexed on the body, the leg on the thigh, and the foot on the leg, with the eyes closed. The foot resting on its outer border is tested by gently pricking the sole of the foot, when the toes, especially the great toe, slowly extend in motor and spastic paralyses, and flex, or remain unmoved, in functional nervous diseases, or in paralyses with atrophies, or lost reflexes, as tabes.— *Canadian Practitioner and Review, April, 1900.*

Induction of Artificial Hyperemia for Therapeutic Purposes. — Bier (*Münch. med. Woch.*, 1900, s. 1598–1694) points out that the essential difference between active and passive hyperemia, whether the hyperemia be arterial or venous, is that passive hyperemia leads to the proliferation of the connective tissue of the affected region; but there is an important distinction to be drawn between the use of arterial and venous hyperemia for therapeutical purposes. To induce arterial hyperemia, Bier employs a wooden box adapted to inclose the affected part and fitted with a tube to conduct into the box air heated by a spirit lamp. The temperature is in this way raised to 100° or 150° C. The thumb and fingers, if not affected, are protected by cotton-wool. Much benefit is obtained in this manner in chronic articular rheumatism and in stiffness of the joints due to past tuberculous disease, but active hyperemia is contraindicated while such disease is in progress. Venous hyperemia is induced in the usual way by an elastic band which does not interfere with the supply of arterial blood; it is used in pseudo-arthrosis and tuberculous disease of the joints, and also, alternately with arterial hyperemia, in chronic arthritic rheumatism. By relieving the affected part from atmospheric pressure, a mixed hyperemia may be brought about; for small areas a cupping glass may be employed; for a limb, one of Junod's boots, from which the air can be partially removed by a suction pump. Bier has not yet succeeded in devising apparatus to suit the several joints, though he thinks this is the most effective method for chronic articular rheumatism.—*British Medical Journal, March 3.*

Concerning the Diagnosis of Rabies.—Dr. G. Daddi (*Rivista Critica di Clinica Medica*, April 7, 1900) emphasizes the importance of making an early diagnosis of rabies, and comes to the follow-

ing conclusions regarding the best means of diagnosis: (1) That histological examination is the best method of determining whether or not an animal that gives suspicious signs is hydrophobic. This is determined by the complex of alterations that is found in the brain, the cerebellum, the spinal cord, and the ganglia of the spinal nerves. The peculiar changes described by Van Gehuchten and Nelis in these ganglia may be of great assistance in diagnosis. (2) That a negative result is of greater absolute value than a positive. A normal nervous system can not be present in a hydrophobic animal. Such examinations are more conveniently conducted during the cold season than during the summer, for putrefaction changes the aspect of the tissues, especially those of the nervous system.—*New York Medical Journal.*

The Relief of Pain in Tabes Dorsalis by Posture.— Linderström (*Boston Med. and Surg. Jour.*, Jan. 11, 1900) describes a method of alleviating the lightning pains of tabes dorsalis without endangering the general health, as is done by the use of the synthetic analgesics. It consists in stretching the sciatic nerve by posture; namely, by flexion of the thigh and extension of the leg and foot. After keeping each sciatic nerve in a state of tension for two minutes, numbness of the feet and discomfort in the region of the popliteal space were noticed, with a slight increase of the ataxia. After five applications of this method, with an interval not longer than forty-eight hours, the patient gained almost complete freedom from pain. There was never employed any medication for the relief of the pain in the case quoted, and the relief persisted for nearly a year, and it may be longer.— *British Medical Journal.*

Pathology of Acute Chorea.— H. Campbell Thompson (*Clin. Journal*, Sept. 13, 1899) reports a pathological examination of a case of acute chorea of eighteen days' duration. The movements had begun in the arms, but in two weeks had affected the whole body, being so violent as to be relieved only by chloroform, and to make it almost impossible for the patient to take food. The day before death obstinate vomiting set in; the patient became exhausted, and her movements less violent, the temperature rose to 104,° and death followed.

Post-mortem showed hyperemia of the brain and cord and a few minute hemorrhages into the white matter of the brain; the heart showed a recent acute inflammation of the endocardium. Cultures from the inflamed valve, bacteriological examination of the valve, and attempts to obtain micro-organisms from the blood were all negative.— *The Canadian Practitioner and Review, April, 1900.*

Williamson's Test in Diabetes.— Lucibelli (*Gazz. degli Osped.*, Oct. 29, 1899) has made a clinical and experimental examination of the above test, and finds it extremely delicate and trustworthy. By its means it is quite possible to detect sugar when no evidence is given by examination of the urine. The test consists in the admixture of a drop of blood with a warm alkaline solution of methyl blue (1 in 6,000). If sugar is present, the solution becomes greenish or dirty pale yellow (almost the color of normal urine). The author's experiments showed that in diabetes mellitus and in alimentary glycosuria, Williamson's reaction could be observed even when the urine gave no reaction.— *British Medical Journal, Jan. 27, 1900.*

The Eye Symptoms of Locomotor Ataxia.— C. O. Hawthorne (*British Medical Journal*, March 3 and 10, 1900) concludes from a record of thirty cases: (1) That an optic nerve atrophy, an ocular paralysis, or an Argyll-Robertson pupil may exist as an isolated symptom for a long time; (2) that any two may be associated, with an increased presumption that the process causing them is of the locomotor ataxia order; (3) that any one of the three, or a combination of two, or all of them may exist in conjunction with more or less pronounced evidences of spinal disease; (4) that occasionally a case which commences with purely ocular symptoms may be seen to develop with comparative rapidity characteristic symptoms of the spinal lesion of locomotor ataxia.—*Medical Record, March 24, 1900.*

Etiology and Dietetic Treatment of Gout and Rheumatism.— W. H. Porter (*New York Med. Jour.*, March 24,

1900) attributes both of these affections to suboxidation due to the prolonged intake of a larger amount of nutritive pabulum than can be perfectly oxidized; also to the action of bacteria on the intestinal proteid contents. Dietetic treatment should consist in reducing the ingesta to a point where the amount taken can be perfectly oxidized. The diet should also be free from all substances which readily undergo putrefactive changes.—*Medical Record, March 31, 1900.*

Intestinal Indigestion and Its Relation to Pulmonary Disease.—Chauncey Rea Burr says that the intestinal tract and the liver are the two points at either one of which, if a departure from the normal occurs, an autointoxication may result. The intestine becomes a veritable culture-tube for micro-organisms, these giving rise to toxins, ptomains, and toxalbumins, which pass to the liver, poison its cells, and the filter, in leaking, floods the circulation with poisons. The lungs, being excretory organs, suffer greatly, and the author describes the various pulmonary affections due primarily to intestinal intoxication.—*Medical Record.*

Friction and the Cold Bath in the Treatment of Typhoid Fever.—According to the *Medical Record* for March 10, Dr. Frank Billings advocates the cold bath friction in the treatment of typhoid fever, the friction greatly hastening the elimination of toxins. [It also increases the volume of blood coming in contact with the cold water, and thus reduces temperature.—ED.]

The Therapeutic Use of Water.—George P. Sprague (*Medical Record*, March 10, 1900), discourages the employment of hydrotherapy by those who are unacquainted with its physiological effect. But when its physiological effects are kept in mind, the scientific application of water is a valuable means of combating disease.

Alcohol a Deceiver.— From an editorial in the October, 1899, number of the *Alienist and Neurologist* we quote the following with reference to alcohol: —

"It is a vasomotor paralyzant, causing transitory excitation of psychic neurons through superabundant blood flushing. The arterioles are dilated through paralysis of their nerves of control. A deceptive impression of bonhomie, warmth, and power is created by this transitory flushing of the brain, face, and skin.

Infiltration Anesthesia.— Experiments made by Drs. Braun and Heinze show that cocaine in extremely dilute solutions is efficient in producing useful anesthesia. A weak solution is useful, being 1-20,000, or one grain of cocaine hydrochlorate to two pints of distilled water. A solution consisting of one grain dissolved in five ounces of distilled water was found more serviceable, giving very little pain on injection.

A New Drug Habit.—A new drug habit has recently developed in Prussia. It is the so-called "ether habit." In one year in the town of Memel there were sold 8,560 liters of ether. It is stated that the effect is more potent than that of alcohol, and that the habit produces lesions of the heart, kidneys, and liver.

Massage under the Hot Air Douche.—A. Frey (*Deut. med. Woch.*, (Leipsic) February 1 and 8) describes an apparatus with which hot or cold air can be applied to any part of the body through a tube. Frey combines it with massage just outside the douched region, and relates two observations—gout and rheumatism — in which extremely beneficial permanent results were attained with half-hour treatments.

Sale of Tuberculous Meat in Berlin.— According to the *Medical Record*, Jan. 20, 1900, it has been recently discovered in Berlin that, through the connivance of officials in the city stockyards, large quantities of condemned tuberculous beef have been smuggled through, and sold to a large restaurant and to several big sausage makers. An official investigation has been ordered.

How to Preserve Rubber Articles. — It is stated by Professor Krolikowski, after extensive tests, that the best method of preserving rubber articles is to keep them in a one-per-cent solution of formal or zinc chloride or a concentrated solu-

tion of boric acid. He further states that red rubber keeps better than black.

Cinnamon as an Antiseptic.— C. G. Grant, M. D. (*Br. Med. Jour.*), when in Ceylon, observed that persons engaged in work in the cinnamon gardens were immune to malaria. By experimentation Dr. Grant found that cinnamon proved valuable as an antiseptic in gastroenteritis, recurrent boils, and typhoid fever. He also found it of great service in influenza.

To Relieve Pain and Keep Burns from Scarring.— After washing the surface of the burn by allowing a solution of one dram of common soda dissolved in a pint of tepid water to run from a sponge over the surface, apply the following prescription: —

℞ Bismuthi subnitratis	ʒj
Vaselin.	ʒj
Acidi Carbolici	m. v.

This added thickly and covered with a light dressing will relieve pain instantly. —*Journal of the American Medical Association.*

Fruits in Typhoid Fever.— Abbott (*N. W. Lancet*, August, 1899) in typhoid fever permits the use of stewed or baked apples, pulp of grapes, the juice of oranges, and bananas if properly ripened. He does not encourage the use of alcohol, as he considers it both unnecessary and injurious.

Rheumatism Successfully Treated by Means of Dry Hot Air.— E. Calderon, M. D. (*Pacific Medical Journal*, November, 1899), reports four cases of rheumatism in which he used the Betz apparatus in applying heat, with decided beneficial results. The higher the degree of temperature used, the more satisfactory the results.

The Consumption of Meat Keeps Doctors Busy.— According to the *Medicus*, March, 1900, more doctors are kept busy in Australia than in any other country on the planet; at the same time Australia consumes more animal food than any other country.

Poisoned by Chicken Salad.— According to the *Medical Record* of March 31, about one hundred persons were recently poisoned by chicken salad at an entertainment given by a church missionary society at Lima, Ohio.

Massage in Ulcers.— Hartschek (*Medical Record*, Jan. 27, 1900) advises the use of massage in ulcers, especially centripetal effleurage at the sides and below the ulcer in proportion to the induration of the edges.

A NEW danger is said to be found in Turkish tobacco. A report to the Marine Hospital Service says that tuberculosis is spreading rapidly in the Turkish tobacco factories in Constantinople. In order to preserve the peculiar odor of Turkish tobacco, it must be exposed to air and light as little as possible; hence in the rooms where these workmen are employed there is very little ventilation, and the air becomes filled with dust, which quickly develops a chronic bronchitis and ultimately tubercular infection.

IT is not often that a man celebrates his silver wedding twice in his life, with a different wife each time, but the St. Petersburg *Medical Wochenschrift* relates this of a Russian merchant who recently died at Belgorod. He is known to have traded at the yearly markets for over a hundred years, and it is claimed that he was 140 when he died.

ALL hypodermic injections may be rendered less painful and be more readily absorbed if the active substance is dissolved in saline solution instead of plain water.

I WOULD always rather hear that a sick person had slept than that he had taken regularly the prescribed medicine during the sleeping hours.—*Sir Benjamin W. Richardson.*

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

Micro-organisms in Tumors.—Sjöbring (*Centralbl. f. Bakt.*, 1900, XXVII, s. 129) gives the results of an investigation on which he has been engaged since his first publication on this subject in 1890. Proceeding from the idea that the hypothetical virus of cancer must be a facultative parasite and capable of growth outside the animal organism, he has devoted his attention to the cultivation of the organism in question. As a medium he employed 8 per cent peptone gelatin, to which was added 1.5 per cent of a concentrated watery solution of potash soap prepared from human fat, 1 per cent of cane or grape sugar, and generally 50 per cent of sterile ascitic fluid, the medium being sterilized. Tubes of this medium were inoculated with pieces of fresh tumors (not ulcerating), removed asceptically, and incubated for a week at 37° C., or at the room temperature. By this procedure he has succeeded in obtaining organisms from about thirty tumors of various kinds; namely, carcinomata of the skin, mamma, stomach, uterus, ovary, rectum, sarcomata, ovarian cysts, uterine myomata.

The organisms from the different tumors grew with varying rapidity; from some an abundant growth, from others only a scanty growth, was obtained. These organisms, which were to be seen only in fresh preparations of the culture, belong, the author affirms, to the rhizopods. The possibility of the appearances being due to lecithin, myelin, or other non-living organic matter, he refutes by the occurrence of ameboid movement and fission. The appearance of the organisms is very variable, but three varieties may be recognized; namely, ameboid forms, typical rhizopod forms, and involution (or resting) forms. The ameboid forms possess the greatest interest, and are divisible into the following types: (1) minute delicate vesicles with a thin wall and watery contents; (2) larger, spherical, transparent, or finely granular bodies, with eccentric homogeneous nuclei; (3) similar to (2), but as large as a tumor cell, some enclosing a similar smaller cell in their interior; (4) rounded or sausage-shaped, greenish, shining bodies, with one, two, or more vacuoles, round which the protoplasm is concentrically arranged; (5) plasmodial forms, with pseudopodia and large nuclei; (6) encysted forms. The involution forms are found in cultures in which extraneous bacteria are flourishing. The fully developed rhizopod forms were only occasionally seen, and particularly in dilute media. Three types were encountered. In the same culture the type always remained constant. A series of eight mice were inoculated with such cultures; in four, positive results were obtained. A culture from a mammary carcinoma produced on subcutaneous injection a cylindrical-celled cancer arising from the sweat glands and hair follicles after three months. In the second a less typical result obtained. In the third a culture from an ovarian colloid cystoma produced on intraperitoneal injection a colloid cystoma arising in connection with the epididymis; in the fourth, a well-defined tumor of an adenomatous nature arising from the sweat glands. In all the cases the parasitic forms found in the human tumors were to be seen.

Bacteriology of Influenza.—Cantani, in *Riforma Medica*, April 6, 7, and 9, 1900, after a clinical and bacteriological study of a large number of cases of influenza in Cardarelli's clinic in Naples, concludes that there is no doubt as to the specific nature of Pfeiffer's bacillus. He gives a brief review of the literature of the subject, and states that in thirty persons who were in perfect health, and who had not had influenza for at least a year previously, he did not find the bacillus of influenza in the sputum. He concludes that the bacillus of Pfeiffer can not exist in the mouth of healthy individuals without giving "some account of itself." The frequency with which the bacillus of influenza is found in the sputum of tuberculous persons has been noted by many observers. Cantani found Pfeiffer's germ in seven cases out of forty tuberculous sputa examined—in other words, in 17.5 per cent—and all the patients in whose sputum both germs were found, had suffered at one time or another from influenza, the attack of grippe usually considerably aggravating their condition. The writer further ex-

amined the sputum of forty patients suffering from catarrhal broncho-pneumonia, and found Pfeiffer's bacillus in only ten of these. Consequently, it is not right to attribute to influenza so large a percentage of broncho-pneumonias as is commonly done.

Cantani also finds that there exist clinical forms of disease simulating exactly the picture of influenza, and yet due to other germs, as no influenza bacilli are found in the sputum. In such cases the examination of the sputum is the only means of positive diagnosis. In fact, headache, prostration, and rheumatoid wandering pains are common to a number of bacterial infections; for example, intestinal infection due to the bacillus coli communis. Has not this latter so often and so well simulated influenza that some clinicians have named this condition the gastric type of influenza?

In speaking of the frequency with which the bacillus of Pfeiffer is found in influenza, the writer says that often a repeated examination of the sputum is necessary before a positive result is obtained. It is to be noted that the bacillus is not found with greater frequency in simple chronic bronchitis during an epidemic of the grippe. In one hundred and thirty cases he found the germ only eleven times, and always in patients who had previously suffered from influenza. The persistence with which the bacillus is found in chronic diseases of the air passages is quite marked; in one case the writer found Pfeiffer's germ in the sputum of a person suffering for years from chronic bronchitis, seven months after the last attack of influenza. In typical cases of influenza, Cantani found the germ, in twenty-seven cases out of thirty, in the sputum or in the nasal secretion. The examination of the blood, the urine, and the feces for Pfeiffer's bacillus gave negative results.

In regard to the specific nature of the germ, Cantani performed the following experiment: He injected very small quantities of pure culture of the bacillus into a healthy man, and the resulting reaction showed that the intoxication produced by the germ probably depends upon the poisons contained in the bodies of the bacilli, as well as upon the action of the hypothetic toxins eliminated by this organism.

The writer does not believe that the agglutination test is of positive diagnostic value in influenza, either in the typical or the aberrant forms. He also found that Pfeiffer's classification into true and pseudo-influenza bacilli is not supported by experimental evidence. In old cultures the true germ often becomes so modified morphologically that it assumes the larger size, width, and other peculiarities of the so-called pseudo-bacillus. —*New York Medical Journal, May 5, 1900.*

Condition of the Blood in Eclampsia.—M. Levinowitsch (*Centralbl. f. Gyn.*, No. 45, 1899) has published the results of a study on the blood in eclampsia, which is of special importance. Since Döderlein discovered micro-organisms in eight cases of eclampsia, the blood of which had been bacteriologically examined by him, it has generally been believed that some cases of eclampsia have micro-organisms in the blood as the exciting cause. Levinowitsch has made systematic examinations of the blood since May, 1898, in cases of eclampsia, and has obtained the following results: (1) In fresh blood taken from forty-four patients there were present large cocci of round or oval form, and extraordinarily mobile. They were often arranged in pairs (diplococci), the round cocci being smaller than the oval. (2) Cultures were made from the freshly drawn blood of twenty-eight patients, in bouillon, gelatin, and agar-agar, with the result that colonies and growths developed in twenty-five cases. The micro-organisms flourished freely at the body temperature, and also grew readily on sterilized fragments of placental tissue. Cultures when three or four days old showed the presence of the large oval cocci mentioned above, arranged in pairs and in fours. They stained with aniline dyes, and showed the presence of a mobile cilium or flagella. The above forms were met with in blood taken during the first eclamptic seizure, or within two days after an attack. (3) Older cultures showed involution forms of the coccus as well as an umbilicated spore-bearing form and a dumb-bell shaped form. These forms, excluding the last, were met with in the blood of patients two days after an attack. (4) The cultures were found to be pathogenic toward guinea pigs, and in four weeks after

inoculation the animal developed acute anemia and hemorrhagic endometritis. (5) In one instance the coccus was found in the blood of the mother who suffered from eclampsia, as well as in the blood of her newborn babe. In two other newborn children, attacks of eclampsia were met with. Finally, Levinowitsch states that he has found the microbe in the blood of pregnant women who had not suffered from the fully developed attacks of the disease, but who had nevertheless been suffering from headache, edema of the ankles, and attacks of vomiting.— *British Medical Journal, April 21.*

Usefulness of the Diazo-Reaction. — James R. Arneill (*Amer. Jour. of the Medical Sciences*) emphasizes the value of the Diazo-reaction, insisting on the original method of Ehrlich, which is as follows: —

Solution A.	
Sulphanilic acid	1
Hydrochloric acid	50
Distilled water	1,000
Solution B.	
Sodium nitrate	0.5
Distilled water	100

Forty parts of A are shaken up with one part of B. Equal parts of this mixture and urine are mixed, then overlaid with strong ammonia.

A positive reaction is indicated by a red color, but more important is that the foam must be tinged with a *pure pink*, no matter what the density is.

Applying this to some 405 selected cases of typhoid, tuberculosis, and other infective diseases, he is struck with its importance in prognosis.

Cases of tuberculosis giving the reaction on several consecutive days will run a short course.

Cases of typhoid not giving the reaction are always very mild, while disappearance means a favorable course.

Reappearance after the usual course of the disease points to a relapse or the outbreak of tuberculosis.

In 158 cases of gastritis the reaction was obtained but once.

Tobacco and Bacteria.—According to a paragraph now going the rounds of lay journals, a new function has been discovered for the all-pervading microbe, in imparting flavor to tobacco. Mr. Clarke Nuttall declares that the characteristic taste and smell of the leaf, the peculiar aroma which renders it grateful to the smoker's palate, are due entirely to the action of bacteria. The leaves when gathered are left for a certain time to dry and wither, after which they are stacked together to induce fermentation. It is in this process that the activities of the microbe come into play, for myriads of these organisms are evolved, converting by their action the decaying mass into the "fragrant weed" of commerce. A German bacteriologist, Dr. Suchsland, after diligent research, not only discovered the secret of the transformation, but succeeded in cultivating and transplanting its microscopic agents, and by introducing those taken from the finest West Indian weed into a heap of poor German tobacco, actually converted it into a leaf of a very high quality, which connoisseurs failed to trace to its lowly origin. In Florida, which has started tobacco culture on a large scale, and in 1897 exported 160,000,000 "Havana" cigars, a special laboratory has been established for the investigation of the bacteria of tobacco. The question is asked whether they may not flourish on other leaves, and perhaps transform common cabbage into a smoker's ideal.— *Medical Times, January, 1900.*

The Pathogenic Action of Milk Microbes.—R. Jemma (*Rev. Mens. des Mal. de 'Ens.*, January, 1900), from a number of researches, concludes that the pathogenic action of the ferments of casein are the following:—

1. The casein ferments most frequently found in milk belong to the group of bacillus subtilis. This has no pathogenic action upon the animals used for the purposes of experimentation.

2. Among the casein ferments we may meet microbes belonging to the group bacillus mesentericus vulgatus. Some of these are at times endowed with pathogenic powers when a large number are ingested, and act upon the intestinal mucosa; when introduced into the peritoneal cavity, the blood, and subcutaneously, they produce no effect. Their pathogenic action would appear to be due to trouble caused in the contents of the digestive tract and on the intestinal mucosa rather than to the secretion of toxins.

3. The bacillus butyricus of Huëppe and allied varieties, when isolated from milk, appears to be without pathogenic action.—*Am. Jour. of Obst. and Diseases of Women and Children, March, 1900.*

Note on the Influence of the Temperature of Liquid Air on Bacteria.—Allan Macfadyan and S. Rowland (*Medical Record*) report the results of exposing various micro-organisms (bacillus typhosus, bacillus coli communis, bacillus diphtheriæ, bacillus proteus vulgaris, bacillus acidi lactici, bacillus anthracis, spirillum choleræ asiaticæ, staphylococcus progenes aureus, bacillus phosphorescens, a sarcina, a saccharomyces, and the bacteria in unsterilized milk) to the temperature of liquid air (—190° C.) for a period of some days. In no instance could the slightest structural alteration in the bacteria be discovered, nor could any impairment in the vitality of the organisms be detected, except that in one or two instances the growth of the subcultures was slightly delayed.

Cultivation of the Lepra Bacillus.—Juan de Dios Carrasquilla (*Gaceta Medica Catalana*, Feb. 15, 1900) says that Hansen's bacillus may be cultivated in gelatinized human serum when this is sown with lymph taken from a leper by Herman's method. A second culture, identical with the first, may be obtained by transferring to other tubes of gelatinized human serum. The bacillus may also be cultivated in bouillon after previous culture in gelatinized human serum. The bacillus grown in both is aerobic and motile. The aptimum temperature is 37° C. The temperature may be reduced to 25° for a few hours without injury, but the bacillus is destroyed at a temperature of 45° C.—*Medical Record.*

Pathogenic Bacteria in Mollusks.—Dr. Mosny (*Journal des Praticiens*, Feb. 24, 1900) concludes his articles with the propositions: (1) The bacteriological analysis of the organs of mollusks and of the water retained in their shells has revealed the presence of bacteria pathogenic for man, in particular those of typhoid fever, the coli bacillus, and vibrios similar to those of cholera. (2) Experiments have shown that certain pathogenic microbes, and in particular the Eberth bacillus, the coli bacillus, and the vibrio of cholera, artificially placed in contact with oysters, could remain living and virulent in the organism of these mollusks and in the water retained between the valves of their shells, for a longer period than usually elapses between their being taken out of the water and their being sold for consumption. —*Medical Record.*

The Smegma Bacillus.—Oscar A. Dahms (*Medical Record*), among the differential points distinguishing the smegma and syphilis bacilli, says that the latter are, as a rule, slender, straight, or curved rods, while the former are smaller plump rods. The Smegma organisms are more readily decolorized by alcohol. They may also resist the action of acids for two minutes or longer, while the organisms of syphilis are decolorized by acids in thirty to forty seconds. The latter are stained well by Doutrelepont's method, while the smegma bacilli are not. In differentiating the smegma from the tubercle bacillus, Marion Dorset has found that Sudan III stains the tubercle bacillus a bright red, while it does not stain the smegma bacillus.

The Effect of Cold on Micro-organisms.—Prudden has shown that a temperature many degrees below the freezing point is ineffectual in destroying the typhoid bacillus, but now it has been shown that no known degree of cold will destroy these and some other pathogenic microbes. A paper was read last week before the Royal Society in London, in which a number of startling experiments by Professors Dewar and Mac Fayden and Sir James Creighton Browne were reported. In these experiments typhoid, cholera, diphtheria, and other pathogenic bacteria were submitted for twenty hours to the temperature of liquid air (—130° F.), and were shown later by culture-tests to be still alive. —*Medical Record.*

Origin of Basophilic Granules in Red Blood Corpuscles.—Cohn believes that the basophilic granules are the result of degenerations which depend to a certain extent on the chemical alteration of the blood serum, since they are always present in anemia.

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BATTLE CREEK, MICH., JUNE, 1900.

NEW FACTS ABOUT DIGESTION.

PAWLOW, of the Petersburg Institute for Experimental Physiology, has recently published the results of extensive experimental investigations carried out under his direction in relation to the work of the digestive glands. The great exactness of the observations made and the scientific skill brought to bear in this experimental research place the results upon a thoroughly scientific foundation. In these investigations he confirms some facts which had previously been held upon less positive grounds than are now presented. Other facts are quite new. All are interesting and practical.

One special point which it was the purpose of the author to settle, was the influence of the different food substances upon the several secretions. Particular attention was given to the study of the pancreatic and gastric secretions. It was found that the amount of secretion varied with different food substances, as milk, bread, meat, etc. Pawlow noted, as have Hayem and Winter, that the gastric secretion slowly rises to a maximum after the taking of food, and follows a distinct and constant curve during the acid stage of digestion. The same is true of the secretion of pepsin and other ferments. These curves differ for different food substances, and remain constant for the same food elements.

A very interesting observation was that the gastric and pancreatic secretions are both under the absolute control of the vagus nerves. Irritation of the vagus increases the secretion, while dissection of the vagus, even during feeding, renders further secretion impossible.

The influence of the sympathetic in favoring secretion was found to be neutralized to a large extent, so as to be almost altogether hidden, by excitation of the vasoconstrictors.

A very important and practical observation was that fats diminish the gastric secretion. Soda diminishes both the gastric secretion and that of the intestinal glands. It was pointed out long ago by Landois and Stirling that the presence of fat interferes with the digestion of hydrocarbons, but Pawlow has shown that fat likewise diminishes the digestion of albumins through its inhibitory influence upon the gastric secretion. This fact explains very clearly the influence of fats in producing so-called "biliousness," a condition in which the gastric secretion is insufficient to prevent the putrefaction of foods in the stomach, giving rise to ptomains which may produce systemic poisoning with the various general and local disturbances accompanying a so-called bilious attack.

The deterrent influences of soda upon the gastric and pancreatic secretions suggest the vast mischief which is being done by the almost universal use of baking powders, saleratus, and salsoda in the making of bread. Another source of injury through the use of alkalis, which ought to be mentioned, but which seems to be unsuspected, is found in several of the popular infant foods, in some of which as high as one per cent of potash is used in the process of manufacture.

Pure albumin was found to have no effect in stimulating gastric activity, but peptones and meat extracts were found particularly active in exciting the development of hydrochloric acid. This observation contains a most important lesson in the therapeutics of hyperchlorhydria. It has long been the custom for

physicians to recommend meats — sometimes an almost exclusive meat diet — as a remedy for this very common gastric disorder. Meat affords temporary relief by neutralizing the hydrochloric acid present, but at the same time the meat extracts which are present stimulate the secretion of hydrochloric acid, which is still further favored by the neutralization of hydrochloric acid by the meat proteids. Hydrochloric acid is formed which is converted into an acid albumin, or syntonin, while the meat extracts encourage the formation of more acid. Thus the malady is intensified.

Carbohydrates lessen the secretion of hydrochloric acid, and hence are the food *par excellence* for this condition. The practical difficulty which is often encountered is the fact that in hyperpepsia, starch digestion is often performed with difficulty. It is a very common thing to find the coefficient of starch digestion as low as 25 or even 20 in cases of pronounced hyperpepsia. It may be even lower in extreme cases. This difficulty may be overcome by the use of heat-digested cereals, such as zwieback, browned rice, granose, granola, and other toasted cereals. In extreme cases it is highly advantageous to go a step in aiding starch digestion by prescribing malt-digested cereals in the form of malted milk, malted nuts, maltose, grānuts, and various foods prepared according to Liebig's formula. It is even wise, and in some cases necessary, to withhold for a time all starch which has not been perfectly transformed, as in Trommer's Extract of Malt and other preparations of similar character.

A FEW FACTS ABOUT FRUIT.

In the summer season the various fruits in great abundance indicate that this particular food substance is especially appropriate for use during the hot months. The following facts will be found of practical interest by those who desire information concerning this subject: —

Green fruits, as the green banana, contain large quantities of starch. As the fruit ripens, the starch is converted into levulose, or fruit sugar, a remarkable substance to which the flavor of fruit is due. Unripe fruits also contain tannin, which likewise disappears in the process of ripening. The ripening of fruit is a sort of cooking process. The starch is first converted into dextrin, then into sugar. Some portions of the dextrin remain unconverted. In Mexico the natives speak of fruits which have been ripened upon the tree as having been "cooked in the sun" (*cocido en el sol*).

The chief characteristics of ripe fruits are the presence of fruit sugar, or levulose, dextrin, and the vegetable acids (stearic, malic, and tartaric). The proportion of proteids found in fruits is very small, in fresh fruits usually from one half to one per cent. Oranges, limes, lemons, grape fruit, and the shaddock contain stearic acid and malic acid to some extent; stearic and tartaric acids are found in peaches, pears, apples, gooseberries, currants, apricots, and cranberries. The most acid fruits are lemons and currants.

The most highly nourishing of all fruits taken in the fresh state are grapes, figs, dates, and cherries. Dried grapes, or raisins, have a high nutritive value, as do the dried fig and date. The following list shows the percentage of sugar contained in a number of common fruits: —

	Per Cent.
Grapes	14.9
Sweet cherries	10.8
Sour cherries	8.8
Apples	8.4
Gooseberries	7.2
Prunes	6.3
Currants	6.1
Whortleberries	5.8
Strawberries	5.7
Blackberries	4.4
Raspberries	4.0
Plums	2.1
Apricots	1.8
Peaches	1.6

The use of fruit diminishes the acidity of urine, and thus antagonizes rheumatism and gout. The acids in fruits undergo changes which diminish the acidity of the blood and aid in the elimination of uric acid. The most digestible fruits are ripe grapes, peaches strawberries, apricots, oranges whortleberries, very ripe pears, steamed figs, dates, baked apples, stewed fruits.

A dietary consisting wholly of fruits is a valuable means of overcoming biliousness. Such a dietary may be maintained for one or two days or a week. A modified fruit dietary is highly beneficial. Two meals may be eaten, the breakfast of fruit only, and the ordinary dinner, or if three meals are taken, the first and last meals should consist of fruit only.

The most laxative fruits are apples, figs, prunes, berries, and peaches.

Fruit soups, made by boiling one part of fruit in four or five parts of water for several hours, are the most wholesome of all soups. Sweet fruit or a little sugar may be added for flavoring. Bananas, if mature when picked, are very digestible, but if withered and tough, they are almost wholly indigestible.

Sweet fruits, as remarked by Dr. Thompson, and also maintained by Cuvier, Sir Everard Holme, and other naturalists, largely composed the diet of the first man. Outside the Arctic zone these fruits to-day comprise the principal diet of millions of human beings. One variety of banana derives its name from the fact that it was the chief article of food with high-class Brahmins in India.

If fruit is taken for the purpose of relieving inactive bowels, the best time for it is half an hour before breakfast.

MEAT EXTRACTS FROM OFFAL.

THE London *Lancet* recently called attention to the fact that meat extracts are largely manufactured from offal, such as putrid livers and the decomposing carcasses of animals whose flesh can not be sold in the ordinary way. Says the *Lancet* :—

"It might be thought impossible that such filthy material could be fabricated into a toothsome paste, but so it is, the use of deodorizers and subtile flavoring material having been placed at the disposal of the offal-mongers by the advances (alas, that it must be confessed) of chemical knowledge."

There is practically no way of stopping this practice, which there is every reason to believe is very common in this country as well as in England, and no method of distinguishing between meat extracts made from animals recently killed and extracts made from putrescent material, except their effects upon the consumer. The poisons contained in beef extracts made from putrid flesh are often so deadly as to cause immediate sickness. Without doubt many cases of sudden illness might be traced to this cause if all facts were known. Beef tea at its best is nothing more or less than a solution of poisons, the ordinary tissue poisons which are found in all animals. When to these are added the poisons resulting from processes of putrefaction which begin almost immediately after death, a combination is produced which can be of no possible service to any human being.

COLD IN PNEUMONIA.

DR. THOMAS G. MAYS, of Philadelphia, has for many years been advocating most earnestly the use of cold applications to the chest in pneumonia. His method is to apply ice in large flat rubber bags to the head and chest. He considers this method better than all others, since it lessens the fever and prevents convulsions in children, allays nervous irritability in adults, controls the pneumonic process by contracting

the pulmonary capillaries, acts as a sedative to the circulatory and respiratory centers, sustains the heart, relieves dyspnea and pain in the chest, promotes resolution and absorption of exudate, and contributes greatly to the comfort of the patient. The writer has made use of cold to the chest in pneumonia for more than twenty-five years and with most excellent results, but prefers the cold compress to the ice-bag. The compress should be wrung out of water at 60°, and should be changed every fifteen or twenty minutes, or as soon as warm. Applied in this way, the compress more efficiently promotes fluxion to all diseased structures. A fomentation applied to the back at intervals of two or three hours is also useful. Care should be taken to rub the chest with a dry flannel whenever the cold compress is removed, so as to maintain the nervous sensibility of the skin. This is necessary to sustain the reflex activities upon which the beneficial effect of this procedure depends. A cold compress should be applied to the entire chest, including the tops of the shoulders. The square compress, described elsewhere in this number, will be found very useful for this purpose.

THE INCREASE OF CANCER.

THE increase of cancer, to which medical writers are frequently calling attention nowadays, is one of the grave indications of racial degeneration and the extension of one of the most deadly of all maladies. The London *Lancet*, speaking on the subject, states as follows:—

"Perfectly accurate figures show that the registered mortality from malignant disease in England and Wales has at least doubled within the last fifty years. Among males, indeed, there has been an uninterrupted increase from 19.5 per million of the male population to 571 per million in the later years of the last century."

The above figures present the most unequivocal evidence that cancer is rapidly increasing. According to the figures given, cancer occurs at the present time more than twenty-eight times more frequently within the last few years of the present century. This fact certainly presents food for thought as to the probable reason for this enormous growth of this deadly disease. There can be little doubt that the use of flesh food, and other influences to which may be traced a deterioration of the constitution, are the essential causes.

THE CARBONIC-ACID BATH IN CIRCULATORY DISEASES.

A RECENT writer in the *Medical Record* remarks as follows: "Carbonic-acid baths in general cause increase of blood pressure; occasionally a diminution is noted. Diminution in the heart's dullness or percussion and increase in urine excreted are observable in some cases. The baths are therefore contraindicated when apoplexy is threatening, or when the heart is just compensating, and can not respond to greater demands."

The above statement is correct only in relation to baths of a temperature below the neutral point. When visiting Nauheim last year, we found the carbonic-acid baths usually given at a temperature of about 88°. This is cool enough to produce a decided contraction of the peripheral vessels, which will, of course, cause a raising of blood-pressure, and increase the risk of cerebral hemorrhage in cases liable to this accident. This, however, may be entirely obviated by simply elevating the temperature to 92° or 93°, and instructing the attendant to rub the cutaneous surface with sufficient vigor during the bath to maintain a good surface circulation.

Hot foot baths should be taken before entering the carbonic-acid bath. The liability to cerebral hemorrhage is not due to the carbonic acid gas, but simply to the temperature of the bath.

The Battle Creek Sanitarium.

LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, M. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR MAY.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
103 per cent.	11	1	12
100 " "	94	82	176
96 " "	10	8	18
93 " "	7	8	15
89 " "	1	2	3
86 " "	2	7	9
82 " "		1	1
78 " "		4	4
75 " "		1	1
71 " "		1	1
Below 70	3		3
Total	128	115	243

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	75	32	107
Between 4,500,000 and 5,000,000	24	36	60
" 4,000,000 " 4,500,000	15	31	46
" 3,500,000 " 4,000,000	4	12	16
" 3,000,000 " 3,500,000	1	3	4
" 2,500,000 " 3,000,000	3	1	4
Below 2,500,000	6		6
Total	128	115	243

Examination of Sputum. — There were 39 examinations made, 35 being new cases. Tubercle bacilli were found in 5 cases.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	28	97	15	100	62	77	105	84
Less than 10,000 bac					1	2	1	1
Between 10,000 and 100,000 bac.					4	5	4	3
More than 100,000 bac.	1	3			14	16	15	12
Total	29	100	15	100	81	100	125	100

The patients were received from the following States and countries: Michigan, 21; Ohio, 14; Indiana, 11; Pennsylvania, 8; Illinois, 7; Iowa, 7; Alabama, 4; Wisconsin, 3. Tennessee, 4; Minnesota, 2; Missouri, 2; California, 2; Montana, 2; Texas, 1; South Dakota, 2; West Virginia, 1; Maine, 1; Washington, 1; Washington, D. C., 1; New Mexico, 1; Canada, 3; Africa, 1; Philippine Islands, 1; Trinidad, 1; unclassified, 9. Total, 125.

Urinary Laboratory.— Total number of specimens examined, 682; number of new cases, 294; number of cases having albumin, 34; casts, 8; sugar, 3; pus, 123; blood, 18.

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MODERN MEDICINE

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ORIGINAL ARTICLES.

CHRONIC CONSTIPATION A SYMPTOM RESULTING FROM A DISORDERED STATE OF THE SYMPATHETIC NERVOUS SYSTEM: ITS CAUSES AND CURE.[1]

BY CHARLES E. STEWART, M. D.,

Battle Creek (Mich.) Sanitarium.

CHRONIC constipation, although commonly called a disease *per se*, is in reality only a symptom indicating the presence of some more general disorder. This symptom, if such we may be permitted to term it, is one which accompanies a great many disorders, being most frequently met with in persons having some other digestive disturbance. Whenever encountered, it is an indication of some inhibitory power acting through the motor, vasomotor, secretory, or sensory mechanisms, or the alimentary canal. These mechanisms, being involuntary in nature, are under the control of the sympathetic nervous system; consequently the primary cause of the constipation must be sought for in some inhibitory influence acting on any or all of the mechanisms referred to.

A brief survey of the anatomy and physiology of the sympathetic system will make clear the anatomic relationship existing between the cerebrospinal and the sympathetic system, and also their control over the functional activities of the alimentary canal.

The sympathetic system, although not wholly removed from the influence of the cerebrospinal, as will be seen later, has to a certain degree an independent action of its own, by means of which it controls nutrition and visceral rhythm. The sympathetic system consists essentially of (1) a series of small ganglia located on the posterior roots of the spinal nerves, close to their emergence from the cord; (2) a series of ganglia located on either side of the vertebral column, extending from the base of the skull to the coccyx, these being joined together by means of nerve fibers, at the top by the ganglion of Ribes, and at the bottom by the ganglion impar, thus making a continuous chain of ganglia, commonly known as the gangliated cord, or vertebral ganglia; (3) three large gangliated plexuses located in the thorax, abdomen, and pelvis, known respectively as the aortic, abdominal and pelvic plexuses, or prevertebral ganglia; (4) an innumerable number of smaller ganglia located in relation with the various viscera and blood and lymph vessels, known as the terminal, automatic, or visceral ganglia, and (5) a large number of nerve fibers. These are of two kinds,— communicating and distributory. The former connect the ganglia with each other and with the cerebrospinal nerves; the latter connect the prevertebral ganglia with the automatic ganglia located in the viscera and circulatory system. The spinal nerves are connected with the vertebral ganglia by means of the white rami communicantes, which pass out from the anterior roots of the spinal nerves, some fibers passing to the vertebral, others directly to the prevertebral without communicating with the vertebral ganglia. There are also gray rami, consisting of non-medullated nerve fibers passing back from the vertebral ganglia to join the main nerve trunk of the spinal nerve, part of the fibers passing back to the cord as vasomotor fibers to supply the vessels of the cord and its coverings, the remainder passing with the main trunk of the nerve to supply the blood vessels of the periphery.

The white rami are composed of visceral and vascular fibers, which are medullated. The gray rami contain fibers which are non-medullated, and are vasomotor in their function. The white rami are of special importance in connection

[1] Reprinted from the Journal of the American Medical Association.

with the question under consideration, in that they influence the functional activities of the alimentary canal. Certain of these medullated fibers of the white rami pass from the cord between the second dorsal and the second lumbar nerve, to supply the viscera and blood vessels, which, according to Gaskell's nomenclature, are called splanchnics. These have been divided into three sets, according to location: (1) thoracic; (2) abdominal; (3) pelvic. The abdominal splanchnics consist of three main nerves, or trunks, designated the greater, lesser, and smaller splanchnics. The first is formed by branches from the sixth to the tenth thoracic ganglia. It pierces the crus of the diaphragm, and joins the solar plexus. The second or lesser splanchnic is formed by branches from the tenth to the eleventh ganglion. It pierces the diaphragm and joins the solar plexus. The third or smallest splanchnic arises from the last ganglion, pierces the diaphragm, and terminates in the solar plexus. These three nerves frequently communicate with one another, and all end in the aggregation of sympathetic nerve substance located posteriorly to the stomach and surrounding the celiac axis.

From this, the greatest of the sympathetic nerve centers, fibers are distributed to all parts of the abdominal viscera. Its functions are to control the secretory, vasomotor, nutritional, and visceral ganglionic activities. The secretory functions of the intestinal glands are directly under the control of Meissner's plexuses, which are located in the submucous coat of the intestine, and are influenced by the solar plexus.

The vasomotor functions are controlled by means of fibers reaching the blood vessels through the splanchnics, the greater splanchnic being the largest vasomotor nerve of the body. The nutritional and visceral ganglionic activities of the intestine, while under direct control of the visceral or automatic ganglia, are predominated over by the solar plexus. The independence of action possessed by the visceral ganglia is observed in the rhythmic peristalsis which occurs in the intestine when removed from the body. This is well illustrated in the intestine of the dog.

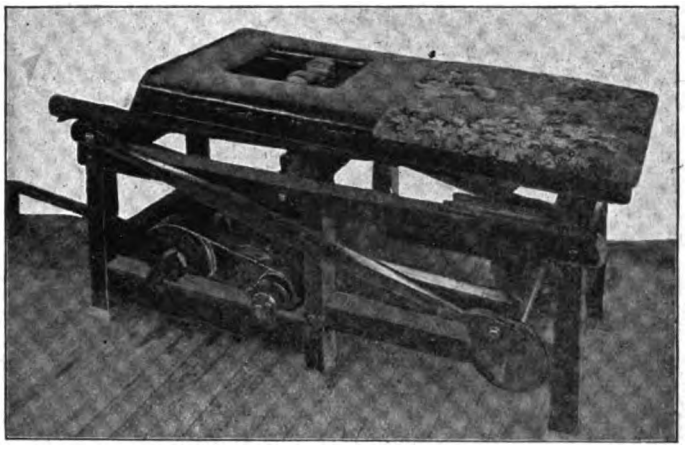
Auerbach's plexuses, between the longitudinal and circular coats of the intestine, extending from the esophagus to the rectum, are automatic motor centers, and it is through the influence of these that it is possible for peristalsis to take place in the intestine after removal from the body. When these centers are uninfluenced by any stimulus, there is a condition of aperistalsis.

While the automatic motor ganglia are found in both the large and the small bowel, there is considerable difference in the rapidity of the peristaltic wave in each. The nerves influencing the small intestine cause rapid peristaltic movements, while those controlling the large bowel and rectum cause slower movements. This difference in activity between the large and the small bowel is undoubtedly due to the difference in innervation; the small bowel is influenced by fibers from the solar plexus, while the inferior mesenteric ganglion of the sympathetic system influences part of the transverse and the descending portion of the colon, the sigmoid flexure, and the rectum. It is a well-known fact that the peristaltic action of the alimentary canal is largely under the influence of the blood supply, the latter in turn being controlled by the vasomotor nerves.

The relative amounts of oxygen and carbonic acid gas contained in the blood determine to a considerable degree the rapidity with which peristalsis takes place. The greater the amount of oxygen present in the blood, the less the peristaltic movement; and the greater the quantity of carbonic acid gas present, the greater the peristaltic action. In the absence of other stimuli, and when blood containing a normal amount of blood-gases passes through the intestinal blood vessels, the usual normal peristaltic movements occur.

The abdominal splanchnics, which contain inhibitory, motor, vasomotor, and sensory nerve fibers, when stimulated, materially alter the peristaltic movements of the small intestine. When the blood supply of the intestine is normal, stimulation of the splanchnic inhibits peristalsis; when there is an increased amount of blood in the intestinal vessels, stimulation augments peristalsis. The opposite is true when there is an increased amount of arterial blood circulating through the intestinal vessels. The inhibitory fibers are easily exhausted by an increased amount of venous blood. Stimulation of the splanchnics after death always

causes peristalsis, which is in all probability due to the fact that there are motor fibers present which remain excitable for a longer time than the inhibitory fibers. The vasomotor function of the splanchnic is observed by the constriction of the blood vessels which takes place when it is stimulated. When the nerve is severed, there is dilatation of the intestinal vessels. The sensory function of these nerves is observed in the painful conditions arising in certain disorders of the abdominal viscera.



KNEADING MACHINE.

While the functions of the alimentary canal are almost entirely under control of the sympathetic system, the cerebrospinal system has a modifying influence through the action of the vagus on the stomach and the upper portion of the small intestine, and the action of the sacral nerves on the sigmoid flexure and rectum. In certain diseases of the central nervous system, obstinate constipation results from a disordered state of the reflex mechanism governing the sigmoid flexure and rectum. As a result of this condition, the large bowel is unable to unload itself, while the small intestine keeps forcing its contents onward, thereby overloading the fecal reservoir, and producing obstinate constipation.

Constipation, then, may be considered a symptom characterized by prolonged retention of feces in the alimentary canal, caused primarily by inhibitory influences acting on the motor, vasomotor, secretory, and sensory mechanisms of the alimentary canal. As these mechanisms are chiefly controlled by the sympathetic system, constipation might properly be termed a neurosis of this system.

The etiological factors in the production of the disorders which give rise to the symptom constipation are many, and, as previously indicated, are those which exercise an inhibitory influence on the motor, vasomotor, secretory, and sensory mechanisms of the canal. The motor mechanism may be disturbed either generally or locally; generally, by anything causing an atonic condition of the muscular or glandular activities of the canal, as cancer, diabetes, chlorosis, anemia, etc.; locally, by strictures, sacculi, tumors, gravid uterus, enlarged prostate, or anything which locally interferes with peristalsis. Localized pain from hemorrhoids, fissures, tumors, etc., is also an etiological factor in the production of constipation. This is undoubtedly caused by the individual shrinking from evacuating the bowels because of the accompanying pain. This failure to evacuate soon interferes with the visceral rhythm, which, together with the retained fecal matter distending the canal, soon renders the musculature inactive. Although capable of acting independently, the vasomotor and secretory mechanisms in the main act in unison. This is due to the close relationship existing between the two mechanisms, each being more or less dependent on the other.

Since the amount and character of the secretion depends largely on the amount and character of the blood, a condition of intestinal anemia means an absence of intestinal secretion, which has a tendency to produce intestinal constipation. In those disorders in which there is a diminished amount of secretion, as fevers and diabetes, constipation is a common symptom. In persons whose occupation keeps the perspiratory glands overactive, constipation is of common occurrence. Failure to respond promptly to the demands of nature in this respect interferes with visceral rhythm and soon results in a constipated condition of the bowels.

Constipation is more common in females than in males, due in part to the more sedentary and indoor occupation of the former, and in part to woman's man-

ner of dress, which limits the action of the intestine, and is also a causative factor in the production of enteroptosis. Chronic constipation is a symptom in active and chronic disorders of the brain and cord, as meningitis and myelitis, and is also observed in tetanus. Diet undoubtedly plays an important rôle in the production as well as the relief of this symptom. It is a well-established fact that dyspepsia, with its long train of varying symptoms, of which constipation is a frequent one, has improper food for its origin in the majority of cases.

Drugs, which are almost universally used for the relief of constipation, are certainly one of the chief causes of chronic constipation ; but their use usually relieves the symptom by producing another of an opposite character, and one just as disagreeable to the patient. Instead of removing or curing the causative factors, purgatives, by their stimulation of the motor and secretory mechanisms, temporarily increase the sluggish peristalsis, thereby giving temporary relief. After the effect of the drugs has been expended, the original state of sluggishness, but to a greater degree, usually returns, requiring a more powerful purgative to produce evacuation. This drugging process is frequently kept up until both the patient and the physician are nearly exhausted.

Sometimes it is difficult to decide whether or not a person is suffering from constipation, because of the fact that what may be a normal number of evacuations for one person is inadequate for another. However, in a very large percentage of cases, one normal evacuation in twenty-four hours is considered sufficient, while two evacuations in this period, or one in forty-eight hours, may be considered normal for a smaller percentage. In some, one movement a week seems to be sufficient. Besides the retention of fecal matter, there is generally a sense of fullness, lassitude, mental depression, or headache; the tongue is usually coated; the breath may or may not be foul. These conditions are generally relieved as soon as a free evacuation is obtained, but will return if fecal matter again accumulates. If the bowels remain constipated for a considerable length of time, symptoms of autointoxication are likely to appear. Under such conditions there is apt to be great depression, loss of appetite, sick-headache, and even melancholia.

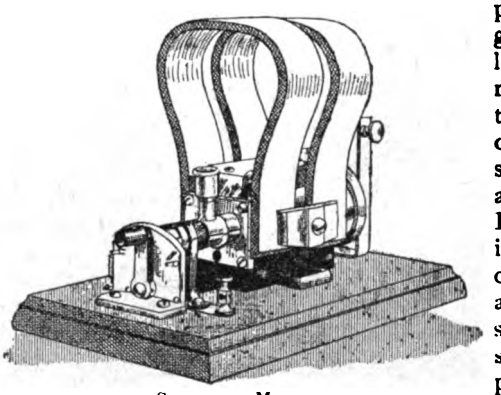
The diagnosis is usually easily made, the patient referring to this particular symptom along with a list of others common to digestive or other disorders. In some cases the diagnosis is not so readily made, and careful physical examination is required before the true condition of affairs can be learned. Diarrhea sometimes accompanies some of the worst cases of fecal impaction, due to the hardened fecal material producing severe irritation, which excites peristalsis, resulting in frequent expulsion of part of the bowel contents.

The prognosis of chronic constipation is favorable unless there is some change in the canal which is not readily remedied. The prognosis is usually favorable, being most so for those patients who can obtain treatment in a thoroughly equipped and scientifically conducted medical institution. While there is perhaps no other symptom so readily relieved by the use of drugs, it is a fact that the fewer drugs used in its treatment the better, for in the vast majority of cases their use is an irrational procedure. It is true that drugs usually relieve the symptom promptly, and the patient is satisfied for the time being, but sooner or later the difficulty will return with renewed vigor, and a stronger purgative will then be needed to effect an evacuation. The remedies which once gave such prompt relief have not only failed to effect a cure, but, on the other hand, have been the means of contributing to the causative factors already at work in the production of this symptom.

Constipation, like any other symptom of a general disorder, must of necessity be relieved by directing the remedial agents at hand toward the removal of the cause. The methods of treatment which have been found to be most satisfactory in the cure of chronic constipation are unfortunately such that many of them can not be employed by the general practitioner so as to give the most satisfactory results. Many of these patients require the combined effects of a most carefully regulated diet, hydriatic and electric applications, mechanical and manual Swedish movements, and carefully regulated exercises.

In the treatment of chronic constipation, the question of diet is of paramount importance. It is through this channel that the foundation of most digestive dis-

orders is laid. Dyspepsia, so universal in America that it is sometimes termed "the American Disease," is largely caused by dietetic errors, the principal one being undercooked and imperfectly disintegrated starchy foods, giving rise to amylaceous dyspepsia. Fermentation from this cause results in the production of poisonous substances, these in turn giving rise to autointoxications. These poisonous substances circulating in the blood have a deleterious influence on the delicate structures of the nervous system, which react in various ways, giving expression to the almost innumerable symptoms common to the different forms of digestive disturbance. The use of condiments and highly seasoned foods has a powerful influence in causing inactivity of the bowels.



Sinusoidal Machine.

The writer is of the opinion that the diet is one of the first factors to be considered in the establishment of a cure for chronic constipation. The patient should be instructed to adopt as nearly as possible an aseptic dietary. This should consist of foods containing the proper amount of carbohydrate, nitrogenous, and fatty food substances required to nourish the body properly. The carbohydrate foods, which make up the largest share of our food, should be taken in the most easily digested and assimilable form obtainable. Foods containing a very large percentage of starch should be thoroughly cooked. Ordinary cooking by means of boiling is not sufficient, for the raw starch by this process is simply changed to amylodextrin, or soluble starch. The soluble starch, however, can be further digested by means of dry heat. When starch is subjected to a very high degree of dry heat, or moist heat under pressure for a sufficient length of time, it is converted into erythrodextrin and achroödextrin. The latter, when subjected to the action of saliva, is converted by the ptyalin into maltose, a product capable of immediate absorption. Food prepared in this manner is so readily digested and absorbed that it relieves the stomach and intestine of the burden of retaining a large amount of starchy material which, under the favorable conditions frequently met with in disorders of digestion, is so prone to undergo putrefactive changes. By the use of such thoroughly cooked starchy foods these fermentative changes are lessened, or entirely checked. The question of nitrogenous and fatty food substances is also an important one. The animal kingdom is relied on to a large extent to furnish these two important elements. The readiness with which animal foods undergo putrefactive changes renders them questionable, especially for those cases in which fermentative changes readily take place. The nitrogenous and fatty material, which can readily be obtained in sufficient quantities and proper proportions from grains, including the legumes, and edible nuts, does not have the tendency to decompose that the same foods from the animal kingdom do. Besides possessing this important qualification, grains are also a very wholesome and economic source of food supply. When one buys a pound of zwieback or rice, he is not paying for seventy or eighty per cent of water, as he does when he buys a pound of beefsteak. On the contrary, he is getting more than eighty per cent of food; he is also obtaining his food direct from nature's garden, and not allowing it to be utilized by some other animal no more capable of storing up energy from it than himself. The use of such pure foods, properly cooked, can not have other than a normal influence on the digestive tract.

Another source of food supply which might be drawn upon more extensively to good advantage is fruits. In these the quantity of nourishment is not great, but what is present is readily digested and assimilated. Nature does in the fruit, during the ripening process, what art does in the cooking of starch by dry heat; *i. e.*, she converts the starch into sugar. Besides the sugar,— and a greater or smaller amount of nitrogenous and fatty food substances,— which varies ac-

cording to the variety, fruit contains succulent juices which promote an abundant flow of the digestive fluids, and furnish the body with a considerable amount of pure water and salts, both of which are essential to proper metabolism. Most fruit juices also have an inhibitory action

NATURAL ABDOMINAL SUPPORTER IN POSITION.

on germ growth. From the three sources of food mentioned; *viz.*, fruits, grains, and nuts, an ideal dietary can be selected for both the sick and the well. It was the original diet of man, as outlined in Genesis, and a dietary that will make a sick man well and keep him well. George Cheyne, in his "Essay on Health and Long Life," written in 1725, says, "Animal food and strong liquors seem not to have been designed for man in his original make and frame, but rather indulged, to shorten the antediluvian length of life, in order to prevent the excessive growth of wickedness."

In selecting a dietary for a patient troubled with chronic constipation, such dry foods as zwieback, browned rice, etc., are found to be palatable, easy of digestion, and at the same time to present bulk enough to excite gentle peristaltic movements. Nuts, in order to be of service, should go through a special process of preparation. At the present time such specially prepared nut foods as protose, nuttolene, malted nuts, grānut, bromose, and a number of others can be found on the market. A careful analysis of these nut foods has been made in our laboratory, and they have been found to be sterile and wholesome, and to contain nitrogenous and fatty material in proper proportions to meet the demands of the human economy. A diet consisting of granose, browned rice, protose, steamed figs, prune marmalade, and ripe fresh fruits, such as apples, strawberries, oranges, etc., almond butter, and cream, is so palatable, nourishing, and easy of digestion that the most fastidious epicure could find no fault with it.

The patient should be instructed to use no liquid with his meals, other than that which is contained in the food. A glass of cold water half an hour before each meal, and as much hot or cold water as is desired two and one-half to three hours after each meal, will prove beneficial. He should also be instructed to eat the dry food at the beginning of the meal. The dryness of the food will necessitate thorough mastication and insalivation, resulting in the thorough digestion of the starch.

After arranging a proper dietary and giving the patient explicit directions concerning it, treatment should be instituted at once to relieve him of the accumulated mass of fecal material. This can usually be done by means of cleansing enemas of warm water, using from one to two quarts at a temperature of 100° to 102° F.; if this fails, two ounces of olive or sweet oil, followed by a strong solution of soapsuds, one to four pints, at a temperature of 100° to 102° F. The cleansing enemas should be employed for three successive days, and should be followed by the graduated enema, which is given as follows: The first day after the last cleansing enema use seventy-two ounces of water at a temperature of 102° F.; the second day, 64 ounces at 98° F.; the third day, 56 ounces at 92° F.; the fourth day, 48 ounces at 88° F.; the fifth day, 40 ounces at 84° F.; the sixth day, 32 ounces at 78° F.; the seventh day, 24 ounces at 74° F.; the eighth day, 16 ounces at 70° F.; the ninth day, 8 ounces at 64° F.

The effect of this treatment is to keep the lower bowel from becoming obstructed, and at the same time to give tone to the walls of the bowel by gradually reducing the temperature and the amount of water used. The impressions thus made on the mucous membrane of the bowel reflexly excite the splanchnics, which, in turn, through Auerbach's and Meissner's plex-

uses, excite normal peristalsis. This treatment should be taken at the same time each day, to establish a rhythmic movement of the bowel. The cold also stimulates the secretion of the liver, and the portal system, which in turn affects the intestinal circulation. Besides the graduated and cleansing enemas, other hydriatic procedures, such as the hot enema, the cold enema, the *umschlag*, or moist abdominal bandage, the cold sponge bath, cold mitten friction, cold douches, and alternate hot and cold douches to the abdomen, the wet-sheet pack, and the cold sitz bath, are very effective through their influence on the sympathetic centers and splanchnic nerves in exciting the various functional activities of the intestine. The Scotch douche, which consists of rapidly alternating applications of heat and cold, when applied to the abdomen, has a strong tonic influence on the abdominal muscles and also on the involuntary muscles of the intestine. So far as external applications are concerned, the Scotch douche is the one *par excellence* in exciting to greater activity the motor, vasomotor, and secretory functions of the abdominal viscera.

Abdominal massage, both manual and mechanical, is a very valuable aid in strengthening the abdominal and visceral muscles. Special movements to replace viscera are also valuable. An atonic condition of the abdominal muscles favors enteroptosis, which might properly be termed an etiological factor in chronic constipation. By properly executed massage movements the abdominal muscles are strengthened and the viscera replaced. In cases of prolapsus of the stomach, after replacement by means of carefully executed manual Swedish movements the organ may be retained in place by the natural abdominal supporter. Great relief is frequently experienced by the use of this support.

The support should be adjusted while the patient is in a reclining position.

The value of abdominal massage in the treatment of chronic constipation has received insufficient attention, undoubtedly from the fact that there are comparatively few scientifically trained masseurs. The bungling work frequently done by many masseurs, instead of giving satisfactory results, has frequently resulted in increasing the patient's discomfort. When given properly, massage works wonders in relieving a constipated condition of the bowels: by it the blood supply is increased, the musculature is toned up, normal secretory functions are established, all of which aid in the re-establishment of a normal peristalsis.

Mechanical devices have been constructed which, when judiciously employed, give excellent results. Of these the one employed in giving abdominal kneading is of great service in relieving constipation. The apparatus consists of

CANNON-BALL MASSAGE.

a table with a large aperature near the center of the top. In this opening plays a series of six vertically placed bars. Each bar is separately connected with an eccentric, to give it an independence of motion. When in motion, these bars have an undulatory movement. The top of the table is so constructed that with each vertical movement of the bars it moves back and forth, thus bringing the entire abdomen in contact with the kneading bars.

Cannon-ball massage is a valuable adjuvant to other forms of mechanical and manual treatment. This treatment may be employed by the patient himself. It consists in rolling over the colon from right to left a four to six-pound cannon ball covered with leather.

Electricity, although little utilized for the relief of the condition under consideration, in many cases can be used with good results. This is particularly true of the sinusoidal current, which can be used

with great advantage where there is an enteroptosis due to relaxed abdominal muscles. When the abdominal muscles are relaxed, the stomach, bowels, and other viscera become pendent, and drag on the branches of the prevertebral ganglia of the abdomen, resulting in reflex disturbances which give rise to pain and other symptoms, among which constipation is not an infrequent one. After replacement of the viscera, the application of the slow sinusoidal current to the abdominal muscles produces results which can not be accomplished by any form of passive exercise.

By means of a rectal electrode introduced into the rectum, and a pad electrode placed over the abdomen, the musculature of the lower portion of the alimentary canal can be gently exercised by the rapid sinusoidal current. This form of treatment gives most excellent results in those cases in which there is a semiparalyzed condition of the musculature of the rectum due to failure on the part of the patient regularly to evacuate the bowel.

Exercises calculated to develop the body as a whole, and especially to develop the abdominal muscles, are of great importance. If the general musculature of the body is in an atonic condition, that of the alimentary canal is likely to be in a similar condition, and vice versa.

It is indeed surprising to note the readiness with which a functionally disordered sympathetic system will respond to such rational measures as have been outlined, and when these are directed toward assisting the *vis medicatrix naturæ*, the most gratifying results are obtained.

THE TREATMENT OF HEATSTROKE.

BY J. H. KELLOGG, M. D.,
Superintendent of the Battle Creek (Mich.) Sanitarium.

SUNSTROKE, thermic fever, heat prostration, heat exhaustion, insolation, are only other terms for the condition commonly called heatstroke.

Two clearly defined forms of this disease are recognized:—

1. Thermic fever, hyperpyrexia, is the form of sunstroke characterized by sudden onset, hot, dry, burning skin, rapid pulse, high temperature, and marked cerebral nervous symptoms, sometimes cyanosis, dyspnea, coma, and convulsions.

2. Heat prostration, or heat exhaustion, usually comes on gradually. There is drowsiness, yawning, thirst, slight rise of temperature, with pallor, cold, clammy skin, feeble pulse, and tendency to syncope and collapse.

Treatment.— In case of heat exhaustion or prostration, or when collapse is threatened, a hot bath, which may be a hot immersion bath or a hot blanket pack, should be employed. The temperature should be as hot as the patient can bear, and should be continued five to eight minutes. The patient should then be removed, wrapped in warm blankets, and cold friction should be employed. A hot enema should be administered, and the patient should be made to drink water freely.

In case of sunstroke, or thermic fever, much more vigorous measures are required. Vigorous rubbing, with cold water poured upon the patient from a height, is a measure which has long been in use, and is, perhaps, the most efficient procedure which can be employed. The tendency to apoplexy in this condition requires that the cutaneous circulation be stimulated to the highest degree. Antipyrin and other antipyretics should be carefully avoided. If necessary, artificial respiration should be employed. Cold friction should be continuous until the temperature falls to 102°. The cool enema may be required as well as cold friction. The patient should be made to drink water freely. The ice-cap or the cooling head compress should be applied continuously. The aim should be to secure perspiration as soon as possible, hence after the cold friction, the patient should be wrapped in blankets. Fomentations to the spine and the hot enema aid in encouraging diaphoresis. If necessary, after the temperature has been reduced by cold friction, diaphoresis may be encouraged by the hot blanket pack or the hot immersion bath,— 104° to 106° for five minutes,— followed by the dry pack.

Care must be taken to keep the head thoroughly cooled. The ice-collar may be applied for this purpose, and napkins wet in ice water may be applied to the face, scalp, and base of the brain. The hair should be kept thoroughly wet with ice water, and the fingers run through the hair at intervals. Ice water may be

poured upon the head. Since the danger does not end with heatstroke until after several hours, as in heat exhaustion, but serious after effects are likely to appear, it is important to continue treatment until the patient is restored to his normal condition.

After the acute symptoms have been subdued, the patient's temperature having become normal, a tonic measure, such as cold friction, the half bath at 75° for several minutes, and the rubbing wet sheet, should be employed daily. Cold friction may be applied twice a day. Care should be taken to protect the head by thorough cooling during these applications, on account of the great tendency to congestion. After a severe attack of heatstroke, patients often remain in a neurasthenic state from which they can be recovered only by several months of tonic treatment.

HYDRIATIC TREATMENT OF PLEURISY WITH EFFUSION: REPORT OF A CASE.

BY CHARLES E. STEWART, M. D.,
Battle Creek (Mich.) Sanitarium.

MR. J. F. S., a merchant, aged twenty-two, applied for treatment April 8, 1900. The patient's family history showed that his mother died from cancer, and two uncles from tuberculosis of the lungs. Three years ago the patient developed a cough which was quite severe during the winter months, but which improved during the spring and summer. Last summer he had night sweats for several weeks. Seven weeks previously to his coming to the Sanitarium for treatment, he had some difficulty with his lungs, which was diagnosed as pneumonia. This trouble kept him in bed for five weeks. The patient stated that during this attack he had very high fever, difficult breathing, and pain in both sides, especially in the lower left lung. Throughout the whole course of the illness there was no expectoration. The sixth week he was able to be up and move about, but was short of breath, and had a temperature of 102°. Toward the close of the seventh week, he decided to come to the Sanitarium for treatment. When he arrived, his temperature was 103.5°, pulse 140, respiration 40.

Physical examination revealed a man of small frame, emaciated, of sallow complexion, and appearing as if he had been sick a long time. The upper part of the right chest was depressed, and there was diminished expansion. The lower chest on each side was increased in size, the intercostal spaces were obliterated, the apex beat was not noticeable, palpation revealed defective expansion of the lower chest on both sides, also deficient expansion on the right upper chest, and increased expansion over the left upper chest. The apex impulse could not be determined by palpation. Vocal and tactile fremitus was diminished on both sides of lower chest and increased on upper right side; on percussion it was found that there was increased resonance on left upper chest above the fourth rib; below this point the percussion note was flat. Traube's semilunar space was obliterated, the dullness extending higher up behind than in front; on percussion of the right side, instead of Skoda's resonance, the percussion note from the clavicle to the nipple was quite flat; this was over the depressed portion of the chest previously referred to, a dullness similar in character to that of the left side being at the lower border of the fifth rib, making it impossible to determine the upper border of the liver. Change in position caused a change in the level of the fluid on both sides. On auscultation it was found that the breath sounds were absent over the area of effusion, and much diminished over the subclavicular region of the right lung. Baccelli's sign was present. No râles were audible. As near as could be determined by auscultation, the apex of the heart was beneath the sternum.

The patient also had hemorrhoids and a small left inguinal hernia. His reflexes were all sluggish; he complained of dyspnea, and pain in the left lower chest. Deep inspiration showed that the upper right lung was being used only to a very limited degree as compared with the same proportion of the left lung. The urine was of high specific gravity (1.026), small in amount (500 c.c. in twenty-four hours), of strong odor, and contained crystals of calcium oxalates and triple phosphates.

In order to relieve the effusion, energetic hydriatic measures were used, with very gratifying results. The patient was first given an electric bath, followed by a

Swedish shampoo and spray. The chest pack was applied, and changed every four hours. This pack consists of a flannel bandage so constructed that it not only protects the chest, but also covers the apices of the lungs, and the neck. Inside of this is placed a smaller bandage made of several layers of cheese-cloth. This inside bandage is wet in very cold water and wrung dry enough so that it will not drip, then placed so as to cover the lungs completely. The wetting of the bandage causes it to shrink so that when the flannel bandage is placed outside, its edges extend beyond the edges of the moistened bandage. This prevents the possibility of rapid evaporation, and consequent cooling of the skin about the margin of the inner bandage. This is a point which must receive due consideration when this form of pack is employed. If rapid evaporation is allowed to take place, the patient is chilled, and evil instead of good results from its use.

Besides the pack the patient was given fomentations to the chest, a wet-sheet rub, a hot and cold spray to the chest and back, and centripetal friction every other day; also fomentations to the spine, followed by cold mitten friction, every other day. The following is a synopsis of the office report of this case:—

April 9: Temperature, 102°; less pain than yesterday.

April 11: Temperature, 100.4°; pulse, 120.

April 13: Slept better than the previous night; condition somewhat better. Pulse, 120; no cough or expectoration; dyspnea.

April 14: Temperature, 102°; pulse, 108. Patient feels quite well in the morning, but uncomfortable in the afternoon.

April 15: Temperature, 101.4°; pulse, 124; respiration, 40; some pain in the right side.

April 16: Temperature, 101.6°; pulse, 114; respiration, 44.

April 17: Temperature, 101.6°; pulse, 106; respiration, 40.

The physical examination at this time showed the apex beat to be under the sternum, and heard best over the ensiform cartilage. Effusion on the left side was at the nipple in the nipple line, and in the sixth interspace in the axillary on the right side line. The level of the effusion could not be readily ascertained on account of the liver dullness. The patient complained of headache in the afternoon.

April 18: Slept five hours. Temperature, 100.8°; pulse, 114; respiration, 24.

April 20: Temperature, 100°; pulse, 116; respiration, 18. Slept four hours. Patient feels that he is improving in health.

April 22: Less dyspnea, sleep better, slight cough.

April 25: Crepitant râles heard at end of expiration, over right lung in axillary line.

April 25: Temperature, 100.8°; pulse, 110; respiration, 32 Patient not so well. Some pain in right side, which was relieved by fomentations.

April 27: Less pain, slight cough.

April 30: Pulse, 100; respiration, 20. Traube's semilunar space can now be outlined by percussion. The apex beat of the heart is visible to the left of the sternum; increased expansion of the left lung; right upper chest quite flat; expansion limited, lower end of sternum deflected toward the left.

May 2: Temperature, 98.6° in the morning, 99.5° in the evening; there was marked increase in the size of the left chest; lower sternum deflected one and one-half inches from median line to the left.

May 11: Patient making rapid improvement, and walks some every day. Leathery râles heard at the lower border of the left lung; right lung expands more; breath sound in the right lung becoming stronger.

May 17: Rough, leathery râles over the back and the lower front part of the left lung. Patient slept well, and is making rapid improvement.

May 22: Patient doing nicely, gaining in strength, weight, and breathing capacity.

May 30: The chest pack was discontinued, and an electric bath, Swedish shampoo, and revulsive douche to the liver given once a week, fomentations to the liver and spine, cold mitten friction, and a talcum rub twice a week; fomentations to the chest, revulsive douche to the liver, spray, local faradization to the stomach and bowels once a week; fomentations to the stomach and liver, a salt glow, and the revulsive douche to the side and back twice a week.

June 5: Patient feels quite well, expecting to leave for home in a few days.

June 10: Breathing very much improved, especially on the right side; heart normal in position; no cough; dullness over upper lobe of right lung; leathery râles in lower left; slight vesicular sound over middle lobe of right lung. Patient left for home, feeling very grateful for the benefit he had received.

Are We Degenerating?—E. Stuver (*Med. and Surg. Bulletin*, May, 1900) says that the enormously increased percentage of the insane as compared with the whole population within the last twenty or thirty years is strong proof that mental stability is not increasing; that the spread of venereal diseases, tuberculosis, and carcinoma, together with the widespread use of stimulants and narcotics, has done much to taint the blood and lower the vital resistance of the people; and that the intellectual faculties have been cultivated at the expense of the moral nature, with the result of a symmetrical development.

Headaches.—A physician who has been experimenting to discover, if possible, a relation between headaches and the retention of uric acid, found experimentally that he could produce a headache in himself by adopting a diet of meat and cheese—foods which are highly nitrogenous and which in their burning up produce a great deal of uric acid. He found in himself an excessive excretion of uric acid during a headache, which perhaps means that a headache is a sign of nature's effort to relieve the system of a poison that would do worse than produce headaches were it permitted to remain. Such a headachy condition is comparable to the fevers which the human system often establishes for the purpose of ridding itself of disturbing impurities. —*Dietetic and Hygienic Gazette.*

Diet and Cancer.—Sir William Banks (*Dietetic and Hygienic Gazette*), in a lecture on "Cancer of the Breast," makes the statement that as the result of his researches he concludes that overfeeding is the predisposing cause of cancer, and attributes the rapid increase of this disorder to the more general consumption of butcher's meat, the use of which has increased enormously during the last thirty years.

The Hydriatic Treatment of Tuberculosis.—In a recent paper in the *Berliner klinische Wochenschrift*, Winternitz, the greatest living authority on hydrotherapy, calls attention to the great value of hydriatic measures in the treatment of pulmonary tuberculosis. He relies chiefly upon cold baths, especially shower baths and the horizontal jet. He claims the most excellent results in a large majority of cases. Eighty per cent of non-febrile cases gained in weight. Even incurable cases were greatly comforted and relieved.

The Plague.—Adami (Montreal *Med. Jour.*, April, 1900) calls attention to the fact that long absence of the plague from civilized areas of the temperate zone is no indication that such areas are immune to the disease. The author urges the necessity of thoroughly purging our cities, and placing them in the best possible sanitary conditions. He also calls attention to the manner in which the virus is spread,—by rodents, fleas, and parasites. These leave the dead bodies within twenty-four hours, after which time, it is stated, they may be handled with impunity. The local lesion is discovered in only a few cases, and the disease may be induced by rubbing some of the virus on the skin.

Differentiation in Diabetes.—Pavy (*Lancet*, June 16, 1900) differentiates diabetes into two classes, alimentary and composite. In the former the sugar comes entirely from the food; there is no breaking down of tissue, consequently the only abnormal constituent in the urine in these cases is sugar. In the composite form there is true breaking down of tissue, as well as faulty utilization of the sugar in the food. This tissue breakdown causes the appearance in the urine of a series of abnormal products, which are never found in normal urine. The series runs as follows: B-oxybutyric acid, diacetic acid, and acetone.

TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

The Prevention of Tuberculosis.— The Tuberculosis Commission of Munich (Philadelphia *Med. Jour.*, March 24) has formulated regulations for the prevention of tuberculosis:—

"1. The periodic disinfection of all localities much frequented by the public, especially rooms in which many individuals congregate, such as schools, society rooms, churches, cafés, restaurants, hotels, orphanages, barracks, libraries, convents, hospitals, dispensaries, stores, tramways, railroad cars, and cabs.

"2. The prohibition of spitting on floors in rooms and public conveyances; the placing of cuspidors in parks and other public places, and in vehicles of transportation.

"3. The establishment of special playgrounds for children, in order to avoid their playing in localities which phthisical patients might visit.

"4. The disinfection and whitewashing of rooms where a case of phthisis or a death from that disease has occurred.

"5. The annual medical inspection of persons frequenting schools, academies, offices, factories, etc. Any cases found should be reported to the authorities.

"6. The establishment of people's sanatoriums.

"7. The hygienic instruction of the tuberculous, so that they may be able to protect themselves and those coming in contact with them.

"8. The isolation of the phthisical cases in military and general hospitals; if possible, the erection of separate pavilions.

"9. The prohibition of the bathing of the tuberculous with healthy persons; the establishment of separate bath houses for the former, under medical supervision.

"10. The removal of all tuberculous individuals from the schools, and their transfer to colonies in the country, where they may be treated.

"11. The formation of committees with the object of sending the children of poor persons who are suffering with tuberculosis or who have died of that disease, into the country in order to remove them from the infected houses. The children of rich families should also be removed from their homes for a certain length of time.

"12. The improvement of the hygienic and dietetic conditions of the poorer classes by the erection of public kitchens, wayfarers' lodges, bath houses, etc.

"13. Philanthropists should make it their object to improve the nutrition and hygiene of individuals in poor families in which tuberculosis has occurred.

"14. The linen of tuberculous persons must be disinfected before being brought into contact with the linen of others.

"15. The marriage of very young persons whose appearance suggests that they are inclined to tuberculosis should be opposed. Persons in whose sputum bacilli are present, should be prohibited from marrying.

"16. The compulsory periodic examination of domestic animals which might become tuberculous.

"17. The monthly inspection of stables; supervision of the hygiene of the kitchen, of milking and milk vessels; scrupulous care in creameries.

"18. The supervision of markets and abattoirs.

"19. The erection of stations at the borders of countries for the inspection of imported animals.

"20. Strict regulations regarding the products of factories.

"21. The giving of weekly lessons in hygiene at public schools.

"22. Each child at school must have its own drinking cup and its own towel.

"23. Instructions to second-hand dealers in books, clothing, etc., to have their wares disinfected. Disinfection of library books, as well as of objects that serve for school or general use, must also be performed at certain intervals."

How to Mount and Preserve Mosquitoes.— Rees (*British Medical Journal*, June 16, 1900) gives the following instructions concerning the mounting and preservation of mosquitoes:—

"Kill the mosquito by placing it in an ordinary killing bottle, or if this is not available, a little chloroform or tobacco smoke will do as well. When dead, turn it over on its back, separate the legs if they are together, place a large drop of thick xylol Canada balsam on a slide, in-

vert this gently on to the mosquito, and in this way it is picked up without any injury; then with a fine needle spread out and arrange the wings and legs, and if necessary, press down the thorax very carefully. Next pour on some thin xylol Canada balsam; as this runs out, it straightens the proboscis and antennæ, and they do not, as a rule, require to be touched. Put the specimen on one side to harden, then chip off the excess of Canada balsam, place glass ring on, and fill up the chamber that is thus formed, with Canada balsam. The upper surface should be convex, so that when the cover-glass is applied, no air bubbles are included. Allow the specimen to harden before sending by post. If the glass rings are not at hand, the specimen will keep quite well in the Canada balsam alone, and the last part of the mounting may be completed after the specimen has been sent home. If the mosquito is intended for photographing, great care must be taken in mounting so that it lies as far as possible in one plane."

Treatment of Prolapsus Ani in Children by Ice Tampons.— Hajeah (*Rev. Mens. des Malad. de l'Enfance*, November, 1899) records very successful results obtained by the use of ice tampons, even in the gravest cases of prolapse of the rectum in children. The method consists in the introduction into the rectum of cone-shaped fragments of ice (suppositories) in the operation of reduction of the prolapse. The suppositories can be artificially frozen in molds, and should be from three to three and one-fourth inches in length, and the diameter of the base should be from one to one and one-fourth inches, according to circumstances. Such an iced suppository is enveloped in a piece of iodoform gauze, so that the latter covers it like the finger of a glove. The whole is then introduced into the center of the prolapse and gradually and steadily pushed up till the prolapse is returned, the ice and gauze being carried up with the reduced bowel. Usually no pain is experienced, and the tampon is retained. It should be the rule to introduce a fresh ice suppository with gauze after each defecation. The prolapse in this way becomes less and less in degree, and eventually ceases altogether. The beneficial result attained is due partly to relief of venous congestion and of laxity of mucous tissue of the bowel, and partly to the increased contractility and tonicity of the muscular coat produced by the coldness of the ice and the mechanical contractile reflex proved by it before it melts. The ice-cold water acts for a longer time as a stimulant. This procedure has always been successful in Hajeah's hands, and is strongly recommended by him.—*British Medical Journal, March 10, 1900.*

Rational Treatment of Neurasthenia.— Dr. Frederick A. Mc Grew (*Journal of the American Medical Association*, June 9, 1900) classifies his cases of neurasthenia under three heads: (1) developmental neurasthenia; (2) overstimulation neurasthenia; and (3) developmental plus overstimulation neurasthenia. The developmental neurasthenic needs such exercise (*not* rest) as shall tend harmoniously to develop and strengthen every part of the physical organization, change of diet and surroundings, combined with stimulating and eliminative hydrotherapeutic measures and massage. The overstimulation neurasthenic will be best benefited by complete rest. Dieting, general massage combined with passive movements, special abdominal massage, fomentations along the spine and over the stomach and liver, saline sponging, and general faradism are measures promoting the elimination of fatigue and waste products, and increasing the general muscular and arterial tone. In a neurasthenia in which the developmental and overstimulation elements are both concerned, it is a delicate matter to determine how much is due to insufficient nervous vitality and how much to the abuse of what vitality there is. For the purpose of treatment an approximate estimate must be made, and a course plotted accordingly.— *New York Medical Journal.*

The Treatment of Puerperal Eclampsia by Diuretic Infusions.— Dr. R. Jardine (*British Medical Journal*, June 9, 1900) has for the past three years been treating cases of puerperal eclampsia by means of saline infusions consisting of sodium chloride and potassium bicarbonate of sodium acetate. The infusions are usually given under the breast, a medium-sized trocar and can-

nula, rubber tubing, and a funnel being all the apparatus required. One dram each of sodium chloride and sodium acetate are added to each pint of water, one to three pints being used at a time. The temperature of the solution should be about 100° F. Antiseptic precautions must be rigidly observed. Of twenty-two cases treated in this manner, five died. In one case, death was due to a perforating duodenal ulcer. Of the twenty-three children, ten were alive and thirteen dead. In two cases they were macerated; craniotomy, etc., was performed on three, while three were too premature to live. Of the ten full-term children, eight were saved. The infusions in some cases were repeated within twelve or twenty-four hours. Urine passed after their use showed a marked increase in the amount of urea and uric acid. The subsequent obstetric treatment varied.—*New York Medical Journal.*

The Use of Alkaline Solutions in Surgical Shock.—W. H. Howell (*Am. Jour. Phys.*, July, 1900) calls attention to the very striking individual differences shown by healthy animals to serious operations, some maintaining a good blood pressure and normal heart rate, while others quickly fall into a condition of shock exhibiting a very low blood pressure and a rapid, feeble heart beat. It is shown also that these two important vascular symptoms of shock are often dissociated. In operations upon the brain, especially, a condition of cardiac shock often ensues, the heart-rate being increased one hundred per cent or more, and the beat becoming feeble, while the blood pressure remains within normal limits. In most of the experiments reported, shock was produced by operations upon the cerebrum, without marked hemorrhage, and during this condition alkaline solutions (Na_2CO_3, 5 per cent or ½ per cent) were injected directly into the veins or into the rectum. It was found that in conditions of moderate shock in which the blood pressure remained as high as 60 to 70 mm. of mercury, the alkaline solutions brought the pressure back to permanently normal limits, 100 mm. or more, and caused a marked increase in the force of the heart beat. In conditions of profound shock in which the blood pressure had fallen to 20 or 30 mm. of mercury, the alkaline solutions restored the pressure to about 60 or 70 mm., and brought back a strong heart beat. The effects obtained under these circumstances were relatively permanent, lasting for one or more hours, and it was suggested that repeated injections at certain intervals might result in a permanent recovery of vascular tone. Attention was called to the fact that when the alkaline solutions are injected directly into the veins, care must be taken not to use an excessive amount,—not more than sufficient to increase the total alkalinity of the blood by 0.1 to 0.2 per cent. Rectal infusions of 0.5 per cent Na_2CO_3 in normal saline were recommended as a safer procedure. Experiments made upon the serum obtained from the blood of an animal in a condition of shock, and injected into the veins of a normal animal, indicated that shock-blood contains no poisonous substances.

Meat Eating a Predisposing Cause of Yellow Fever.—In a communication from M. Eugene Ackerman, Director of the Chemical and Bacteriological Laboratory of the Sanitary Commission of Pará, Brazil, to the *British Medical Journal*, he states that he has observed that meat eaters are more liable to the disease than those who live on a vegetable diet. This he attributes to three main causes interworking with what he considers established facts,—that the toxin of the bacillus icteroides is to a great extent elaborated in and absorbed from the intestinal canal, and that it produces the disease only when its elimination can not keep pace with its production. The three causes are (1) the accumulation in the blood of poisons, either extrinsic, from the action of bacteria on animal food outside the body, or intrinsic, from the formation of toxic substances by imperfect digestion of nitrogenous substances; (2) the impairment of the elimination by the kidneys and the bowel of these toxic substances; and (3) a denudation of the gastrointestinal epithelium that follows on disorder of digestion, which is avoided by a vegetable diet. A factor in this intoxication is the inactivity of the liver which is apt to result in hot countries from the use of too much nitrogenous food. The function of the liver as a destroyer of poisons (among which must be ranked peptones)

absorbed from the intestinal tract is one doubtless of extreme importance not always sufficiently recognized.

Massage in the Treatment of Recent Fractures.— W. H. Bennett, M. D. (*Lancet*, June 2, 1900), in a paper on this subject, calls attention to the great value of massage in the treatment of recent fractures. The treatment is advantageous from the following standpoints: (1) The ease with which the patient is made comfortable by arresting the muscular spasm and so relieving the pain; (2) the effecting of rapid absorption of effused blood, etc.; (3) the prevention of stiffness by obviating the formation of adhesions; (4) the prevention of muscle wasting and the preservation, throughout the case, of normal nutrition of the limb; (5) the shortening of the time by at least one half, during which the patient is prevented from resuming the use of the limb.

The massage movements are instituted as early as possible, often on the first day. On the third or fourth day gentle passive movements are made below the fracture, combined in a few days with voluntary motion. A few days later the joint above the fracture is massaged. The author recommends massage as being of special value in intracapsular fracture of the neck of the femur and in fractures in the immediate neighborhood of the shoulder joint.

Congenital Alcoholism. — Nicloux (*L'Obstetrique*, March 15, 1900) by the aid of modern technique, has been able to demonstrate the passage of alcohol from mother to fetus, both in the lower animals and in women. The author administered alcohol to women a short time previously to their being in labor, and then withdrew a quantity of blood from the cord after delivery. This blood was distilled and the amount of alcohol ascertained. In one case a woman was given a milk punch, containing rum representing a definite amount of absolute alcohol one hour before delivery. After delivery, forty-three c.c. of blood were recovered from the umbilical cord, and of this amount about one fiftieth of one per cent was shown by distillation to consist of alcohol.

The experiment was repeated a number of times, and in some cases double the above-named amount of alcohol was recovered. The author concludes that in intemperate women sufficient alcohol would reach the fetal circulation to produce chronic intoxication, or congenital alcoholism, as expressed in nervous derangements, etc. The same results are to be found in those children suckled by intemperate mothers.— *Obstetrics, April, 1900.*

Electric Light in the Treatment of Chronic Disorders.— Winternitz (*Deutsche Medizinal-Zeitung*, April 26, 1900) reports that he has obtained satisfactory results in the treatment of chronic digestive disorders, chronic blood diseases, conditions of weakness, and in convalescence from debilitating diseases, from the use of electric light and sun baths. The author says that these therapeutic measures beneficially influence the circulation and composition of the blood, increase metabolism, and influence diseases of the skin of bacterial origin, such as lupus. This form of treatment is also of benefit in many of the functional and some of the diathetic diseases. Its action is almost specific in anemia, chlorosis, and scrofula.

Remarks on the Pathology of Acute Yellow Atrophy of the Liver.— Dr. J. W. Findlay (*British Medical Journal*, June 2, 1900) reports in detail the pathological findings in a case of acute yellow atrophy of the liver in a girl aged fifteen. The histo-pathology of the liver was especially studied, and the conclusion is reached that over and above the fatty degeneration and increase of connective tissue, there is distinct evidence of an attempt at regeneration on the part of the surviving liver cells. This is shown by the presence of solid columns of hepatic cells in the interlobular connective tissue, where the resemblance to glandular tubes is very marked. They are looked upon as an attempt to form a compound gland, and can be seen to converge toward a portal canal. Although yellow atrophy of the liver is primarily a morbid change of the hepatic cells themselves, yet the writer holds that it is nothing more than an acute cirrhosis of the liver, differing from other cirrhoses in quantitative histogenetic changes. No cultures were taken, but in one of the

branches of the portal vein, there were seen a few large bacilli resembling the bacillus coli communis.— *New York Medical Journal.*

Improved Methods and Details in the Care of Patients during Surgical Operations.— Fenton B. Turck has devised the following methods, which he thinks will be found of great use: (1) An improved laparotomy sheet made from a thin rubber dam, and fitted close to the body; the advantages of this rubber protection are that it not only lessens the danger of infection from the skin, but prevents the latter from becoming contaminated; (2) a similar sheet of rubber dam, with two openings which are re-enforced by rubber bands forming collars; for the protection of the abdominal cavity and the edges of the wound from any possible danger of infection that may arise from opening the viscera, as in operations for gastro-enterotomy, entero-anastomosis, etc.; (3) a "rubber drainage coffer dam," used as a protection against leakage; (4) hot-water bags to be placed within the abdominal cavity for the prevention of shock; and (5) hot-water slippers for the same purpose. The article is illustrated.

Tuberculosis in the United States.— In a paper read before the Chicago Medical Examiners' Association, Dr. G. W. Webster stated that it was estimated that there are 12,000,000 people suffering from tuberculosis in the United States to-day. This disease causes one death in the United States every three and one-half minutes, night and day, throughout the year; it causes one and two-thirds times as many deaths in Chicago each year as diphtheria, smallpox, scarlet fever, typhoid fever, measles, and meningitis combined; it causes more deaths in the United States in one year than there were soldiers killed on both sides in the battles of Gettysburg and Waterloo; and it costs the American people $750,000,000 annually.

Deterioration of Frozen Meat.— According to the *Sanitary Record*, meat kept in cold storage deteriorates. After a time frozen meat loses some of its life principle, which is essential to its nourishing qualities. Such meat is lacking in flavor, and is difficult of digestion and assimilation, and must be flavored with condiments to render it at all palatable. The long-continued use of cold-storage flesh is conducive to diarrheal disorders, loss in flesh, and starvation unless a change in diet is made.

People should be warned against the use of stale eggs and old milk and cream. Milk and cream are kept for days, rancid butter is washed and treated chemically, but all food, and especially cold-storage food, is damaged by long keeping, and will not nourish the body properly.

The Blood in Cancer of the Stomach.— Drs. Wm. Osler and T. McCrae (New York *Medical Journal*), in treating of this subject, conclude as follows:—

1. In a doubtful case a blood count below 1,000,000 red corpuscles is strongly in favor of pernicious anemia.

2. While nucleated red blood corpuscles are present in all severe anemias, megaloblasts rarely, if ever, occur in cancer of the stomach.

3. Neither an increase in the leucocytes nor special variations in the forms appear to be of any moment in the diagnosis of cancer of the stomach.

4. The presence or absence of digestion leucocytosis is too uncertain to be of much assistance in diagnosis.

Rhythmical Traction of the Tongue.— Dr. Schneider, surgeon to the military hospital at Oran, recently treated asphyxia occurring in typhoid fever by rhythmical traction of the tongue. A pair of forceps applied to the tongue and retained for two hours enabled the patient to make traction upon the tongue whenever he felt the approach of asphyxia. A writer in the New York *Medical Journal* suggests traction of the tongue as a possible means of preventing the onset of an epileptic attack whenever the approach of the convulsion is announced by an aura.

Formalin as a Reagent for Blood Examination.— Ernest Kizer (*Indiana Academy of Sciences; American Monthly Microscopical Journal*, May) recommends the following process for fixing and pre-

serving blood specimens. It is said to produce no appreciable distortions, and not to interfere with staining. Mix one volume of perfectly fresh blood with three volumes of a two-per-cent solution of formalin. Allow the mixture to stand at least an hour; then draw a small quantity from the bottom of the vessel with a pipette, by which a drop is to be transferred to a clean cover-slip; spread evenly over the cover-slip, and allow the liquid to evaporate. This method of pressing the cover-slips together, as in sputum analysis, is to be preferred. Pass the cover-slip through the flame, films uppermost, in order to cement the corpuscles to the glass. Dip into a five-per-cent solution of acetic acid once or twice. Remove the acid with water.

The best stain for non nucleated corpuscles is gentian violet (a two-per-cent solution; time of staining, about two or three minutes). For nucleated forms, contrast stains, as methyl blue and gentian violet, or hematoxylin and eosin, of methyl green and safranin, give very good results. Ehrlich's triple stain may be used for human corpuscles. Wash out the excess of stain with water or alcohol, as the stain requires. Remove the alcohol with clove oil or xylol, and mount in Canada balsam.— *New York Medical Journal, June 30, 1900.*

Formalin as an Antiseptic in General Surgery.— G. E. Crawford, Ph. D., M. D. (N. Y. *Med. Jour.*, June 30, 1900), recommends formalin very highly as an antiseptic. He is of the opinion that the solutions most commonly used are too strong, and as a result the surface of the wound is hardened, and the healing process is retarded. A solution of sufficient strength to inhibit the development of pus germs may be used to cleanse, wash out, and pack pus cavities and sinuses without interfering in the slightest degree with healthy granulation.

The author states that he has seen smashed arms and legs which had become a mass of suppuration turned into an odorless, healthy, granulating condition by the use of free drainage, and packing with formalin gauze. In other cases of severe injury where infection seemed imminent, the use of formalin prevented the formation of pus.

Attention is called to the fact that the words "formalin" and "formaldehyde" are frequently used synonymously. This the author rightly states is incorrect; formalin is a forty-per-cent saturation of formaldehyde. Formalin is a definite substance, and is the tangible form in which we employ formaldehyde as an antiseptic; hence the percentage of a given solution should be that of formalin, and not that of formaldehyde. A one-fourth-per-cent solution of formalin equals a 1-1,000 solution of formaldehyde. In order to facilitate the making of such solutions, it is necessary to make a dilution of some known strength from which to prepare the working solutions. A four-per-cent solution, which is made by adding an ounce of formalin to a pint and a half of sterilized water (or 5 ounces to 7½ pints makes a gallon ready for use), is a convenient one. This solution mixes in even ounces and half ounces to make the ordinary solution used in practice. The solutions commonly used are ⅛, ¼, and ½ %, the two former for washing infected wounds, irrigating and packing cavities and sinuses, and the latter for disinfecting hands.

The following table shows this in full:—

Formalin four-per-cent solution: formalin, 5 ounces; sterilized water, 7½ pints.

Working solutions:—

½ oz.	4%	sol.	to	15½ oz.	water	= ⅛%	formalin	= 1/800	formald.
1 "	"	"	"	15 "	"	= ¼%	"	= 1/400	"
1½ "	"	"	"	14½ "	"	= ⅜%	"	= 1/266	"
2 "	"	"	"	14 "	"	= ½%	"	= 1/200	"
2½ "	"	"	"	13½ "	"	= ⅝%	"	= 1/160	"
4 "	"	"	"	12 "	"	= 1%	"	= 1/100	"

In gynecological and obstetrical practice, formalin is also extremely valuable, and meets all the requirements of an antiseptic.

To Prevent the Dissemination of Tuberculosis in Schools.—Because of the great influx of persons suffering from contagious and infectious diseases, the board of education of Honolulu has adopted resolutions prohibiting teachers suffering from consumption and other contagious or infectious diseases from teaching in the schools; and also prohibiting children suffering from the same diseases from attending the schools.

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

The Pathology of Milk.— G. Leslie Eastes (*British Medical Journal*, 1899), in recording the results of the examination of 186 samples of milk, summarizes as follows:—

"*General Statistics.*— Of 186 milks examined, tubercle bacilli were present in 11, and doubtful in 2 others. One was doubtful because only one bacillus, morphologically correct, was found; the other, because, though of the right color, the beading was not apparent in any except one, and in that only imperfectly. In 47 there was pus, and muco-pus was present in another 77. Both of these objectionable features were absent in 51 cases, and the question was decided in the other 11. Blood was noted in 24 samples, absent in 77, and probably absent in 85. Streptococci were found in 106 cases, absent in 53, and undetermined in 27. Colostrum corpuscles were detected in 16 specimens. The percentage in the mixed milks works out as follows: 5.3 per cent contained tubercle bacilli, 30 per cent contained pus, and 48.7 per cent muco-pus, these varieties being therefore present in 78.7 per cent of all mixed milks examined. It was absent in only 15 per cent, and doubtful in the other 6.3 per cent. Streptococci were found in 75.2 per cent of the samples, absent in 15 per cent, and doubtful in the remaining 9.8 per cent.

"*General Conclusions.*— Milk which contains pus or muco-pus and streptococci is unfit for human consumption, but unfortunately, according to my figures, this would entail condemning 80 per cent of the samples examined. No farmer, however, dreams of allowing a cow with an inflamed udder to suckle a calf. Why, then, should he be permitted to sell such contaminated milk for human consumption? Should such milks also contain tubercle bacilli, they should be unhesitatingly condemned as unfit for consumption in any form, for example, as butter, cheese, etc. It is his experience that milk derived from pasture-fed cows is less likely to be contaminated than that from cows which are stall-fed. Nor, of course, is this to be wondered at. The condition of mixed milk should be made more widely known, the conscience of the farmer aroused, so that he may of his own accord isolate those cows suffering from inflamed udders, and not permit their milk to be mixed with that of healthy cows — a practice which in the end would repay the farmer, as the risk of infecting other cows through the milker (and this is, of course, a very real risk) would thereby be minimized."

Bacteriology of Cerebrospinal Meningitis. — Khtegloff (*Meditsinskoe Obosrenie*, April, 1900), after an exhaustive study of the literature on this subject, and from his own observation of an epidemic of cerebrospinal meningitis, arrives at the following conclusions: (1) The disease is caused by Weichselbaum's intracellular meningococcus; (2) the meningococcus is a coccus *sui generis*, not to be confounded with other diplococci; (3) its vitality in agar cultures is especially characteristic; (4) its presence in the nasal secretion of a patient suffering with meningitis is of diagnostic value.— *Medical Record, June 30, 1900.*

The Typhoid Bacillus as Found in the Blood.— Aldo Castelani concludes from his experimental researches that the bacillus is more frequently found in typhoid cases than is usually supposed. By diluting the blood with peptonized and slightly alkaline broth, the bacilli sowed in it usually developed great motility, giving the characteristic turbid appearance to the culture medium. In some cases, however, they were agglutinated on the bottom and sides of the vessel, leaving the liquid almost entirely clear.—*Medical Record.*

The Role of Pus Organisms in the Production of Skin Diseases.— George T. Elliott reviews at length the whole literature, from which it is evident that although micro-organisms, especially the staphylococci and streptococci, are the particular cause of suppuration, yet many other factors, both internal and external, are active. Contradictory results are obtained by different observers, and chaos still exists. Micro-organisms, while the general cause, are not the exclusive cause.—*Medical Record.*

Meningitis Due to the Typhoid Bacillus.—H. Wentworth (*Arch. Ped.*, November, 1899) reports a case in which the diagnosis was based upon the presence in the meninges of a purulent exudation which contained enormous numbers of typhoid bacilli, and the failure to detect the presence of other organisms by means of careful bacteriological examinations.—*Am. Jour. of Obst. and Diseases of Women and Children, March, 1900.*

The Pathogenic Action of the Proteolytic Bacteria of Milk.—Jemma (*Revue mensuelle des Maladies de l'Enfance*, January, 1900) makes the following résumé of the conclusions of a study under this title:—

1. The ferments of casein which are found most frequently in the milk belong to the group of the bacillus subtilis; this has no pathogenic influence upon animals experimented upon in the laboratory.

2. There may be encountered among these ferments of the casein certain microbes belonging to the group of the bacillus mesentericus vulgatus; among them are at times found certain bacilli possessing pathogenic properties, which explains the effect upon the intestinal mucous membrane produced by the ingestion of large quantities of these germs. Introduced within the peritoneum, into the blood, or under the skin, they produce no effect. From this it appears that the pathogenic action of these bacteria depends not upon toxins secreted by them, but upon disturbances which they provoke in the intestinal contents and in the mucous membrane of the intestinal tract.

3. The bacillus butyricus of Hüppe and other varieties of this group isolated from milk are nearly always devoid of pathogenic action.—*American Journal Medical Sciences, May, 1900.*

On a Peculiar Variety of Pathogenic Streptococci.—E. Libman (New York *Medical Record*, May 19, 1900) isolated this streptococcus in pure culture from the mucoid portion of the stools from a case of acute enterocolitis. Besides differing in a number of smaller details from ordinary streptococci, it possesses a feature not before described. When grown on glucose-agar, the whole agar became whitened, although the growth was confined to the surface. The same happened with lactose-agar, but not with saccharose-agar. A very marked result was obtained by growing the organism on the glucose agar to which some hydrocele fluid had been added; the medium became absolutely white, as if it had been heated, or an acid had been added. Anaerobically, a similar result could be obtained with the serum medium only. The whitening of the medium seemed to depend on the production of an acid which precipitated the albumin of the media. The organism is pathogenic for mice, causing an acute inflammation of the gastro-enteric tract. While working on this streptococcus, the author tried to find out whether other bacteria might not have a similar property. He found that a large number of the pathogenic bacteria can precipitate a serum-albumin in the presence of glucose. In a general way the result seems to depend on the amount of acid produced. Pneumococci are the only pathogenic organisms hitherto tested which do not possess this peculiar property. Many bacteria can also precipitate egg-albumin. Most of them precipitate serum-albumin in the presence of 0.1 per cent of glucose, the amount present in the blood normally. With lactose, maltose, and saccharose the results are not so constant. A complete paper on this question is to appear later.

Cultivation of the Lepra Bacillus.—Juan de Dios, Carrasquilla (*Wien. Med. Wochs.*, 1900, p. 654), from his investigations, which were reported to the Academy of Bogota, gives the following directions regarding the technique in obtaining a culture of the bacillus: (1) The lepra bacillus can be cultivated upon human blood serum or upon solid meat bouillons upon which human blood serum is spread, if the culture is prepared according to Herman's method. (2) The second culture obtained from the first presents an identical appearance with it. (3) The bacillus cultivated on bouillon is aerobic and motile. (4) The following conditions are necessary: (*a*) An even temperature of 37° C.; (*b*) the meat bouillon must be neutral or slightly alkaline in reaction; (*c*) the culture must be large to admit sufficient air.—*Jour. of Cut. and Genito-Urinary Diseases, July, 1900.*

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THE INCREASE OF INSANITY.

THAT insanity is increasing at a very rapid rate is no longer a matter of opinion, but has been proved by government statistics carefully collated both in this country and in Europe. The increase is clearly shown by recent statistics to have been fully three hundred per cent in the last fifty years. The number of insane has become so great in most of the older States that appropriations for their care are one of the greatest items of expense which annually come before the State legislative bodies.

The causes of this widespread mental deterioration are numerous, including, perhaps, a large share of the artificial conditions which are created by our modern civilization, and especially those which tend directly to breaking down general systemic and constitutional vigor. The effects of the use of alcohol and tobacco are unmistakable. Dr. Hurd, of an Eastern insane asylum, called attention many years ago to the fact that a large proportion of the insane are the children of drunkards. A man decidedly under the influence of alcohol is in a state of acute mania, a temporary insanity, which, when the habit has existed for some years, becomes a fixed condition. The children of drunkards inherit a neurotic or insane tendency which only requires a little extra strain or a lowering of the physical health to develop some form of mental aberration. The use of tobacco, opium, and even of tea and coffee has been shown to lead directly to insanity.

A cause less suspected is the extensive use of flesh foods, which, by the production of rheumatic diatheses, neurasthenia, and other neuroses, becomes an important factor of various forms of mental degeneracy. That chronic toxemia, or general poisoning of the blood, is one of the causes of insanity has long been known, and Bouchard and Haig have very clearly pointed out that the habitual use of flesh food is one of the most prolific causes of this condition. Late suppers, indulgence in rich and heating food, and various other dietetic abuses are without doubt equally responsible for many cases of nervous breakdown which finally land the sufferer in the insane asylum.

Disappointments and various forms of emotional excitement are in many cases unquestionably an immediate cause of the development of insanity in its acute forms, but these influences must be regarded only as the last straw to serve to increase to the breaking point the tension which had previously been developed by causes less obvious but nevertheless potent through their long continuance and persistency.

"Whatsoever a man soweth, that shall he also reap." The last hundred years have been sowing industriously the seeds of lunacy, idiocy, and epilepsy, and the dire harvest which the present generation is reaping is only a foretaste of what the succeeding generation must certainly reap as the result of the reckless seed sowing of the men and women now upon the stage of action.

The Static Treatment of Hysterical Gastralgia.— At a recent meeting of the Societe Francaise d'Electrotherapie, M. Apostoli and his assistant, M. Planet, gave an account of a case of grave hysterical gastralgia of ten years' standing which had proved utterly rebellious to ordinary measures of treatment,

but which yielded to a single application of the static current. The following were the conclusions drawn from the experience in this case:—

1. Certain gastralgias which are manifestly hysterical in character may simulate the general gastric crisis which often occurs as an early and isolated symptom of tabes.

2. A means of differential diagnosis between these two species of gastralgia is found in Franklinization properly applied.

3. Static electrical applications very quickly bring into clear view any masked hysterical conditions which may be present, by revealing sensory disturbances characteristic of hysteria.

4. Static electrical applications continued for a sufficient length of time may be relied upon as a means of effecting a cure in cases of hysterical gastralgia.

Incompatibility of Fats and Starches.— Landois and Stirling, authorities in physiological science, pointed out several years ago the fact that starch digests with greater difficulty in proportion to the amount of fat mingled with it. Pawlow has more recently made a careful study of the subject, and verifies the statements of Landois and Stirling, adding also the fact that fats decrease the secretion of hydrochloric acid in the stomach. This fact doubtless explains the relation between fat and bilious attacks. When fat is freely used, the gastric juice is not secreted in sufficient quantity to sterilize the contents of the stomach; that is, to destroy the germs which are taken with the food or which might enter the stomach in the interval between meals. As the result, decomposition takes place, ptomains are absorbed, and a sick-headache is the result. Fats undergo no digestive change in the stomach. They are acted upon only after they have passed into the small intestine, where they come in contact with the pancreatic juice and the bile.

The Plague in Lower Animals.— The difficulty of combating the extension of the plague lies largely in the fact that lower animals, especially rodents, suffer from it. Squirrels, rabbits, guinea pigs, rats, and mice are subject to the disease. A person may contract the disease by handling either a living or a dead rat infected by the malady. There are three cases on record in which the development of the plague on shipboard was associated with a mortality among rats, probably from the same disease. Rats contract the disease from food stuffs, especially grain, from the soil, from infected dressings and rags used about plague patients, from infected insects and animals which have died of the disease. Rats, when infected, usually leave their homes and migrate. The disease is more often supposed to be communicated by means of fleas and other infected insects than by any other means.

Treatment of Lupus by the X-Ray. — Scholefield, Schiff, and others report numerous cases of cure by the application of the X-ray. The effect seems to be similar to that of actinic rays of sunlight, as employed by Finsen, of Copenhagen. The X-ray appears to have potentialities the extent of which has not yet been fully fathomed.

The Cause of Cancer.— The rapid increase in cancer during the last few years has given a new impetus to investigators to determine the cause of this pathological process. Of the many theories advanced to prove the etiological factor in the production of cancer, none seem so pregnant with facts as the one which ascribes the causative factor to the consumption of meat.

It is a well-known fact that where meat

is not used as an article of diet, cancer is almost unknown. J. Sawyer, in the *Lancet* of March 24, 1900, quotes statistics to the effect that mortality from cancer has doubled during the last thirty years in England and Wales. The consumption per capita has also increased, especially in meat foods. The upper middle classes who use meat in moderate quantity and well cooked do not show so great an increase in cancer as the great masses of the people who eat excessively of meat which is usually undercooked. From these facts Sawyer concludes that the increase in cancer is in a large measure favored by the increased consumption of flesh foods. From these statistics two points are worthy of attention: first, the great increase in the number of cases of cancer, which has been coincident with the increase in the consumption of flesh foods; and second, that the increase is less in the higher than in the lower classes, because, although consuming more meat per capita than formerly, it has been sterilized by thorough cooking before being eaten.

C. E. S.

PAMPHLETS RECEIVED. — "Gastrostomy for Traumatic Stricture of the Esophagus: Report of Case;" "Treatment of Cancer of the Cervix of the Uterus Complicated by Pregnancy." George Ben Johnson, M. D., Richmond, Va.

"Non-Malignant Gastric and Duodenal Ulcers: with Illustrative Cases." Thomas E. Satterthwaite, M. D., New York.

PUBLISHERS' DEPARTMENT.

MEETING OF THE PAN-AMERICAN MEDICAL CONGRESS.

THE third meeting of the Pan-American Medical Congress will be held in Havana, Cuba, on the 26th, 27th, 28th, and 29th of December, 1900.

NOTICE.— All surgeons, assistant surgeons, acting assistant surgeons, or contract surgeons, and hospital stewards who served in the army or navy of the late Confederate States, will please send their post-office address to Deering J. Roberts, M. D., Secretary Surgeons' Association, C. S. A., Nashville, Tenn.

AT a meeting of the corps of teachers of the New York School of Clinical Medicine held at the Academy of Medicine, June 21, 1900, it was decided to wind up the affairs of the school and close it permanently. This action was taken in consequence of continuous interference of the last Board of Trustees in its affairs.

MANY members of the medical profession are interested in the study of American ethnology and archæology, and not a few have valuable collections of Indian relics and skeletons from Indian graves. Those not directly interested in this study are so circumstanced as to be aware of the hobbies of their neighbors, and could doubtless furnish the address of collectors. I should be greatly obliged for information and for the loan of collections for the use of this department of the Pan-American Exposition. Exhibits which represent study in some special line of American ethnology and archæology will be particularly suitable.

A. L. BENEDICT, M. D.,
Superintendent of Ethnology and Archæology.
Buffalo, N. Y.

THE *Medical Mirror*, of St. Louis, offers $1,000 in prizes, to be distributed as follows: $500, $200, $100, and four prizes of $50 each. The following prominent gentlemen have been appointed on the committee on awards: Dr. Wm. Osler, Baltimore, Md.; Dr. Geo. F. Butler, Chicago, Ill.; Dr. A. R. Kiefer, St. Louis, Mo.; Dr. C. Lester Hall, Kansas City, Mo.; Dr. H. R. Hall, St. Louis, Mo.; Dr. Lewis E. Lemen, Denver, Colo.; Dr. Joseph M. Mathews, Louisville, Ky.; Dr. W. W. Grant, Denver, Colo.; Dr. Thomas Hunt Stucky, Louisville, Ky.; Dr. Hugo Summa, St. Louis, Mo.; Dr. Walter Wyman, Washington, D. C. Entries close Oct. 1, 1900, and the award is made Jan. 1, 1901, giving the contestants three months in which to prepare their papers and to include clinical reports.

The Battle Creek Sanitarium
LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, M. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR JUNE.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
103 per cent.	14	8	22
100 " "	94	70	164
95 " "	17	10	27
93 " "	13	10	23
91 " "			
88 " "		6	6
85 " "	5	3	8
83 " "		1	1
78 " "	4	1	5
71 " "	4	1	5
Below 70	22		22
Total	173	110	283

Blood Count.	Men.	Women.	Total
5,000,000 and over per cu. mm	55	23	78
Between 4,500,000 and 5,000,000	45	35	80
" 4,000,000 " 4,500,000	23	29	52
" 3,500,000 " 4,000,000	5	13	18
" 3,000,000 " 3,500,000	7	8	15
" 2,500,000 " 3,000,000	9	2	11
Below 2,500,000	29		29
Total	173	110	283

Examination of Sputum. — There were 30 examinations made, 24 being new cases. Tubercle bacilli were found in 9 cases.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	43	92	13	86	73	68	129	76
Less than 10,000 bac	3	6			5	5	8	4
Between 10,000 and 100,000 bac	1	2	1	7	14	13	16	10
More than 100,000 bac.			1	7	15	14	16	10
Total	47	100	15	100	107	100	169	100

The patients were received from the following States and countries: Illinois, 19; Michigan, 17; Ohio, 17; Indiana, 13; Pennsylvania, 11; Kentucky, 10; New York, 8; Texas, 6; Iowa, 5; Missouri, 5; Minnesota, 4; Alabama, 4; Louisiana, 3; Montana, 3; Massachusetts, 3; California, 2; Washington, 2; Wisconsin, 2; Tennessee, 2; South Dakota, 2; Georgia, 2; Kansas, 2; Mississippi, 2; South Carolina, 1; British Columbia, 1; Ontario, 1; District of Columbia, 1; Manitoba, 1; Arkansas, 1; Jamaica, 1; West Virginia, 1; Trinidad, 1; Canada, 1; unclassified, 14. Total, 169.

Urinary Laboratory.— Total number of specimens examined, 630; number of new cases, 277; number of cases having albumin, 39; sugar, 5; casts, 5; blood, 7; pus, 117.

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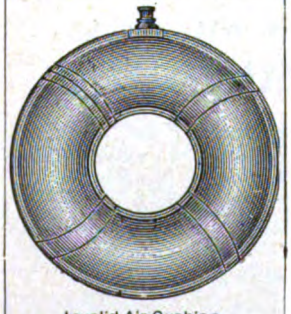
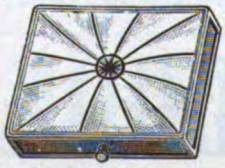
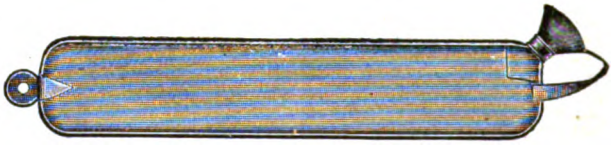


Invalid Air Cushion.



Carriage Cushions.



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" " 26-inch, postpaid	1.40
Hot Water Bags, white rubber, postpaid	1.15
" " " flannel covered, postpaid	1.40
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Invalid Air Cushions, 9-inch in diameter, postp'd	1.70
" " " 12-inch " "	2.00
" " " 15-inch " "	2.50
Air Pillows, No. 1, sateen cover, 9 x 13 "	1.75
" " No. 3, " " 12 x 18 "	2.65
Safety Syringe, postpaid	.42
Ear Syringe, postpaid	.20
Breast Pump, postpaid	.64
Rubber Bed-pans, round	3.35
" " oval	4.35
" " oval, with outlet tube	4.85
Stomach Tubes, postpaid	1.60

Natural Flesh Brush, postpaid			.30
Wet Abdominal Girdle, postpaid			1.75
Carriage Cushions, sateen cover, 14x16, postp'd			5.50
" " " " 16x16, "			6.50
Invalid Chair Cushions,	Seat.	Back.	
No. 1, sateen cover	16x16	16x16	7.50
No. 2, " "	16x16	16x18	7.75

GOOD HEALTH PUB. CO.,

BATTLE CREEK, MICH.

MODERN MEDICINE

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ORIGINAL ARTICLES.

MOLDS IN THE STOMACH.[1]

BY J. H. KELLOGG, M. D.,

Superintendent of the Battle Creek (Mich.) Sanitarium.

FOR several years the writer has given special attention to the study of the bacteria of the stomach. This study has been carried on extensively and in a practical way. Over eight thousand stomach fluids have been examined in the laboratory under his direction, with reference to the number of bacterial elements present, including germs and yeast, and the character of these organisms, especially with reference to their ability to produce acids, toxins, etc. The number of cases in which molds were found is very considerable. They were found 457 times in 7,000 analyses, representing nearly as many different individuals. In many cases only one or two colonies were found, while in others many colonies were present, the number varying from half a dozen to as many as eight hundred.

The sources of molds in foods are rather numerous. The *oidium lactis* is nearly always found in milk, especially when it begins to sour, and is almost constantly present in butter. The nearly universal use of these articles constitutes an abundant source for this common mold. *Aspergillus fumigatus* thrives at body heat, and readily finds its way into the stomach through the use of bread, in which it is commonly present. The *aspergillus flavescens* is likewise capable of developing in the body, flourishing, as does a *fumigatus*, at the temperature of the body. Molds, like various bacteria, give rise to fermentations and putrefactions, converting the hydrocarbons into alcohol and acids, and producing toxins, sulphuretted hydrogen, leucin, tyrosin, etc., from proteids.

As regards the effect of these organisms upon health, *oidium lactis* has been shown to have a decided irritant effect upon the gastric mucous membrane, giving rise to diarrhea, sometimes even producing febrile gastritis, or gastric fever. Koch and Gaffky have shown that some of the molds are constantly pathogenic. This has been proved to be especially true of *aspergillus flavescens* and *fumigatus*. Injection of bouillon inoculated with these molds into the veins of a rabbit produces death within from twenty-four hours to three days. A post-mortem examination of a rabbit killed in this manner shows, under proper staining, colonies of molds growing upon the surface of the internal organs everywhere within the body. The malicious influence of the long exposure of the organism to the toxins produced by the molds is well shown in the disease pellagra, which so often occurs in Italy as the result of eating moldy grain. The writer has noticed in many instances the most pernicious effect from the use of butter, which may have been due to the presence of a considerable quantity of *oidium lactis* in the same. It frequently occurs that patients are entirely unable to eat ordinary fermented bread. This may be due in many cases to the imperfect cooking of the interior of the loaf and to the presence of yeast; but in the bacteriological examination of various specimens of bread made in the laboratory under the writer's charge, yeast has been found present much less frequently than expected; the spores of mold, however, being much more tenacious of life than yeast germs, their presence may, perhaps, be held responsible for the great disturbance not infrequently set up by the indigestion of yeast bread, or fermented bread.

Glénard has pointed out the fact that persons with dilated stomachs are unable to make use of milk in any form. The writer has frequently confirmed this obser-

[1] This article appeared in the *Medical News*, July 21, 1900.

vation, and has become so thoroughly convinced of its utility that for a number of years he has made it a routine practice to forbid the use of milk by patients suffering with marked dilatation of the stomach. A possible cause may be the decomposition of the milk by molds, and the production of toxins.

The most pronounced case of mold infection of the stomach which came under the writer's notice was one in which eight hundred colonies were found. The case was one of pronounced hypopepsia. Only eight milligrams of free hydrochloric acid were present.

Molds grow in acid media, so they are often present in both hyperpepsia and hypopepsia, but with much greater frequency in hypopepsia.

In 457 cases noted, there were found 32 of simple dyspepsia, 176 of hyperpepsia, while 249 were cases of marked hypopepsia.

The full significance of molds in the stomach fluid is perhaps not yet fully understood. The subject is one deserving further investigation.

REFLEX NEUROSIS FROM DISTURBED PELVIC MECHANISM (DYSMENORRHEA).

BY BYRON ROBINSON, B. S., M. D.,
Chicago.

NERVOUS dysmenorrhea is simply dysmenorrhea continued so long that the defective or excessively irritated nervous system has become unbalanced, disturbed, neurotic. Genital irritation has so long functionated the periphery of the various visceral nerve apparatuses that malassimilation is established. Secretions are altered, excessive, deficient, or disproportionate, and the circulation is burdened with waste-laden blood the solids and chemicals of which injure the thousands of delicate nerve ganglia distributed throughout the body. Nervous dysmenorrhea rests, then, on a defective development of the genitals, on inflammation, which checks further growth, and on malnutrition from waste-laden blood irritating the many nerve ganglia. A vicious circle becomes established which feeds itself.

Who can deny the vast influence of the dysmenorrheic genitals over the general nervous system? Dysmenorrhea frequently mars the whole life. It appears like a machine overtaxed. It resembles a person struggling with a burden greater than he can bear. The defective, diseased genitals can not rise to the occasion of a menstrual process, and the repeated monthly trauma and shock to the nervous system hopelessly derange it. The congestion can not rise to a point where the excessively tense fluid can escape, and relieve the pressure.

Old writers on this subject place the great seat of the trouble in the ovary. It is true that the ovary is the central sexual organ, but the ovary functionates continuously, and not with a special periodicity. It is the menstrual organ — the uterus and oviducts — which manifests the nervous strain. The nervous changes arise and subside in the uterus and oviducts during the menstrual period; and the neurosis accompanying the dysmenorrhea decreases in exact ratio to the lessening of the dysmenorrheal pain. Hence, it is clear that the genitals produce the neurosis by reflex action. One of the proofs that dysmenorrhea rests on deficient development, arrest of growth from inflammation, is the deficient flow of menstrual fluid; and, in general, the less menstrual fluid in dysmenorrhea, the more intense is the pain and accompanying neurosis.

The worst dysmenorrheal cases are those with the most atrophic, sharply curved, fixed pathological anteflexion, with atrophic, sclerotic uterus, with rigid, contracted sacro-uterine ligaments, and defective menstrual flow. The neurosis is intimately and periodically associated with the painful menses, so that no doubt can exist that the neurosis is a consequent, a result, of the diseased genitals. In fact, the gynecologist can plainly palpate the diseased pelvic organs. The diseased genitals, as a provocative agent, debilitate the nervous system, and psychosis also accompanies them.

When a dysmenorrheal patient with a regular accompanying grade of neurosis suffers an exacerbation of the inflammation of the genitals,— a palpable one,— the neurosis increases in geometrical ratio, demonstrating the intimate relation of the diseased, dislocated genitals to the existing neurosis. In general, the pain of dysmenorrhea, attacking the menstrual organ, assumes a periodic rhythm, labor-like in character. This also may be ob-

served in that the blood in the *cavum uteri* is changed into fibrin threads. The chief manifestation of reflex neurosis from the genitals may be observed in the premenstrual phase, when congestion is the most violent and tense. Who can doubt the influence of the genitals over the general nervous system? In times of quietude the genitals are not less influential. The only factor that would likely produce mechanical dysmenorrhea would be intrauterine polypus, which, during the monthly periodic uterine rhythm, might be forced into the cervical canal. In such case the sound would enter without showing any mechanical obstruction.

Some authors claim that in many cases of neurosis at the menstrual period, no cause is discoverable in the genitals, and that hence the defect lies in the nervous system. In fifteen years of special gynecological practice I have not observed such cases. All cases of dysmenorrhea which I have examined have been non-developed or diseased genitals. I must therefore view dysmenorrhea, with its accompanying neurosis, as a distinct palpable genital defect. However, the palpability may be disputed, as all border lines are. Some women seem to possess such a sensitive or irritable uterus that the premenstrual phases call up severe and persistent uterine contractions with considerable pain and neurosis. In such cases no palpable genital lesion would appear in the field. If this is what is meant by the irritability residing in the nervous system, we can agree with it. But this may rest on congestion. In these cases of irritable uterus, during menstruation the sound may be introduced without finding blood collections. However, the contact of the sound with the endometrium calls up vigorous uterine contractions, demonstrating some kind of abnormal sensitiveness. Almost all such cases appear to have a lifelong neurosis, a defective, weak nervous system,—a nervous system which meets opposition with irritability, and bears strain badly. In fact, such patients are compelled to rest in bed, for the trauma of moving about produces so many and severe uterine contractions during menstruation that the patient is unable to bear it. In dysmenorrheal patients, the neurosis and monthly rhythm are so intimately related that even the public, which is twenty years behind the profession in opinions, is well aware of the associated conditions. The pain of dysmenorrhea radiates from the lumbosacral region,—the sensory depot of the pelvis,—from the pubic region, which belongs to the hypogastric and ilioinguinal nerves, branches of the lumbar. It radiates along the numerous branches of the pubic nerve, and distally along the great sciatic into the thighs and legs. The pain exists chiefly during the premenstrual phase, *i. e.*, during congestion.

Naturally, from the long-continued existence of dysmenorrheal monthly pain and neurosis, a change or shifting of the neurotic symptoms to the inter-menstrual phase will occur. The general practitioner and even the neurologist, then, falsely begin to point out no relation between the genitals and neurosis. The real cause, the original disturbance, here drops out of sight, but the palpating finger of an experienced gynecologist can soon discover the original difficulty in the pelvis. It may happen, however, that the genitals have actually recovered, but the neurosis still continues. The entire life, the entire existence, of a patient, may be embittered and ruined by the dysmenorrheal pain and its accompanying neurosis. Patient after patient of this unfortunate class appears in the office and clinic.

To illustrate: A patient aged twenty-eight came to me with a uterus about the size of my little finger. She began to menstruate when the uterus was not fully developed, and it was attacked by an inflammatory process resulting in atrophic myometritis. Two or three days of painful scanty flow, with uterine neurotic symptoms, occurred monthly until the neurosis became almost a constant factor. The proximal vagina, the uterus, and oviducts share in the inflammatory process and atrophy. Such a patient, and they are numerous, is embittered and ruined by the constant neurosis resulting from reflexes of the diseased pelvic organs. The uterus is too long diseased and too long atrophic to expect its return to normal. Hence the congestion, with sexual commerce, would only make the patient more neurotic, forbidding marriage. I therefore advise in cautiously selected cases to remove such a defective uterus and to leave the oviducts, the menstrual organ, and ovary *in situ*, which will remove the original cause of the neurosis, and aid in relieving the nervous system of the repeating monthly thorn. It will

give the irritable nervous system a chance for rest and recuperation, with the possibility of the patient's becoming a normal citizen.

The dislocated, diseased genitals may not only produce the monthly painful rhythm by irritable reflexes, but headache is a rule among such subjects. The triumvirate pain — back, head, stomach — is only a part of the vicious sexual circle. All forms of headache arise in pelvic disease;—hemicrania, pain in the top of the head, in the base, in the forehead, pain in the breasts, arms, legs, and back. Frequently this pain ceases with the recovery of the genital disease, but it may continue long after. Doubtless some cases have no relation between the pain and the diseased genitals, but that is not the rule. Indirect factors then arise. The obscurity lies in the fact that it may continue long after the genitals are cured, but the reflexes from the genitals start the bad habit in most of the cases. The two great factors of reflexes from the genitals in producing pain in distant parts of the body are congestion and anemia. The factors amenorrhea, dysmenorrhea, and scanty flow are prominent symptoms of a vicious circle.

Castration for dysmenorrhea frequently makes the neurosis worse, as no healthy organ should be removed for any disease. It is true it may arrest menstruation in from three to six months, but the ovaries are not the organs to remove in dysmenorrhea. A part of the menstrual organ should be removed; if any, it should be the uterus, leaving the oviducts and the ovaries *in situ*. Marriage, by periodic sexual congestions, exacerbates especially the myometritis, the rock and base of dysmenorrhea. It also exacerbates the deficiently developed uterus in which congestion is only a hopeless process. The abnormality on the side of the central nervous system — the cerebrospinal axis — from the reflexes of the dislocated genitals is congestion and anemia. The result is a debilitating effect, and serves as a provocative agent for neurosis, and especially hysteria. Though the hysteria does not belong to the uterus, or liver, or lung, but to the central nervous system, yet every experienced gynecologist knows that the hysterical stigmata are especially exacerbated in the premenstrual phase, or congestive stage. The tense genital congestion is a provocative agent, calling up not only reflexes, but also congestion and anemia of the cerebrospinal axis, the seat of hysteria.

The congestion of the premenstrual phase seems to put the whole nervous system on an irritable tension, at which nervous explosions of various kinds are liable to occur; *e. g.*, the so-called hystero-epilepsy, circulatory, anemic, or congestive, muscular contractions, or peculiar psychosis. There is an outspoken connection between the premenstrual phase and psychosis. Also in mental diseases the state is exacerbated at the premenstrual phase. At this time, especially, is amenorrhea severe; congestions of the cerebrospinal axis will occur, and hence exacerbate neurosis. Neuralgias are intensified at the premenstrual stage.

As far as the treatment of the cerebrospinal symptoms is concerned, we may expect to combat mainly two factors; *viz.*, congestion and anemia. The relief will mainly be managed by increasing perspiration, intestinal evacuation, and kidney secretion. It will relieve congestion and drain the tissues.

In the treatment of those pains which result from and accompany the menstrual process, we must first combat the original cause and then relieve the existing pain. This is accomplished by local and general treatment. I can not speak too forcibly of draining the skin by vigorous salt rubs and massage for three quarters of an hour daily, mostly by the patient herself; of draining the bowels nightly by $MgSO_4$ ℥ss to ℥i in a pint of water, and by regular daily evacuation; and of draining the kidneys by drinking two or three quarts of fluid daily, as the general treatment with a tonic; also of a systematic local treatment with boroglyceride tampons twice weekly, filling the vagina, and vaginal douches in the morning (four to twelve quarts) and evening (four to thirty quarts). This sanitarium method of treatment often makes new subjects in from four to six weeks. They become symtomatically cured, and have courage to persist in further treatment to secure more permanent results. I have pursued this method for almost a decade, with infinitely more satisfaction than any other method.

Since it is probable that the dysmenorrhea and numerous reflexes from the genitals rest on a weakness or irritability of the nervous system and a defective sexual

development, we must expect relapses, and we must renew and reapply the methods of treatment. The three great functions of the body — defecation, urination, and perspiration — must be stimulated and regulated, and local disease must receive its appropriate attention.

However, the patient must be treated as an individual. Specifics, so-called, are of little value. Local tinkering with the endometrium, *i. e.*, local applications applied by means of the sound, generally does more harm than good, as well as dilating the uterus, thus forming thousands of atria for infection. Curettement would better be omitted, but if performed, the endometrium should be well destroyed on its superficial surface by pure carbolic acid.

X-RAY INJURIES, OR SO-CALLED "X-RAY BURNS."

BY ABBIE M. WINEGAR, M. D.,
Battle Creek (Mich.) Sanitarium.

MANY wonderful discoveries have been made in the use of electricity during the last century, but probably none have excited more comment or have been of more scientific value to the medical world than the Roentgen or X-ray discovery. To no one man can be given the entire credit for this valuable discovery. For years such men as Abrea, Gassiot, La Rue, Hittorf, Crookes, and Hertz have been investigating along this line, although not realizing fully the vastness of the subject or the wonders that would yet unfold to the world.

About twenty-two years ago Professor Crookes made some valuable additions to the discoveries in the electrical world, finding that by increasing the vacuum of the glass globe to an extreme degree, the dark space around the cathode increased in size until it filled the entire tube, when the tube became fluorescent. Little more was added to the subject until about seven years ago, when Professors Hertz and Leonard made some further investigations, discovering that the rays passed through sheets of black paper and acted on photographic plates. A few months later, or about five years ago, Professor Roentgen, of Bavaria, while experimenting with the Crookes tube, put it into a cardboard box and excited the tube. Near by was a fluorescent sheet which he noticed glowing, and he found that the rays were powerful enough to pass through the glass tube and the cardboard. Thus photographing through opaque bodies was discovered.

The medical world looked with great interest upon the wonderful discovery which would enable them to peer into the dark recesses of the human body, which, previously to this time, had been obscure.

Marvelous as has been this addition of science to the world, it is not without its disadvantages and dangers. Among the many cases that have been examined during the few years since the discovery of the X-ray, occasional cases have had, within a few days following the exposure, what appeared to be a dermatitis. In some cases the deeper tissues also were involved, and an ugly wound presented itself which, from its appearance and from the apparent cause, has been termed a "burn," although at the present time and in the light of more recent investigation, we are probably no longer justified in calling it a burn.

Dr. Jenkins, of Washington, D. C., in writing of these injuries, says there is no doubt but that the rays do cause burns. Dr. Monel, of Brooklyn, advances the theory that the so-called burns are not due to the tubes or rays, but to the direct contact of electricity. These injuries have affected in some cases the skin only, in others the deeper tissues, causing osteitis, periostitis, inflammation of the lungs, and one case of cystitis is reported, though there is some doubt in this case as to whether the cystitis was due to exposure or to the condition for which the examination was made.

Probably the latest investigations as to the cause of these so-called burns have been made by Dr. Mount Bleyer, of New York City, who has made a large number of exposures, particularly to the chest wall, with a view to gaining information in supposed tubercular cases. His theory, seemingly very reasonable, is that the injury is not a burn, but an inoculation, which explodes the idea that the length of time of exposure has anything whatever to do with it. He believes that owing to the high electromotive force the oscillations or vibrations carry with them

many septic particles which are floating in the air or are accumulated in the garments of the patient, thus setting up an inflammatory or infectious condition. The indication would then be thorough asepsis, as for a surgical operation. Dr. Apostoli, of Paris, believes that there is an injury of the trophic nerve endings.

The history of a large number of these cases seems to point to infection as the cause, from the fact that there is no immediate disturbance, the appearance of symptoms varying from three to twenty days, most of the cases occurring between the third and the tenth day. One case is reported as occurring during the exposure, and another on the twenty-first day, as in the case of Dr. D. M. Orleman, of the Military Academy at Peekskill, N. Y.

In all cases of severe injury, so far as we have been able to ascertain, the symptoms are much the same. There is at first a slight tingling, which increases to a burning sensation, with much irritation and itching, almost unbearable at times, the skin assuming a dark, sunburn color. In some cases, vesicles form and break down, leaving a raw and very painful surface.

The condition is most difficult to heal, many of the cases having resisted all kinds of applications for weeks and even months. When the change takes place, it is very slow and gradual. Those suffering from these injuries have gone from one specialist to another, each of whom has applied the various remedies used for other burns, but in most cases with little effect. Alcohol applied to the skin has in some cases relieved the itching for a time, but it very soon returned. Boracic acid, bismuth ointment, iodoform, picric acid, bichloride of mercury, lead and opium wash, zinc and lanolin, ichthyol, carron oil, vaseline, balsam of Peru, peroxide of hydrogen, nitrate of silver, resinol, aristol, and poulticing have all been tried to remove the sloughs. There seems to be no specific for the very grave condition, it being all the more grave from the fact that the suffering is agonizing and almost beyond endurance, and also from the fact that even after the wound is healed and the parts seem in normal condition, relapses seem rather the rule than the exception. Even after the patient has been well for months, the wound reappears, and he passes through all the first experience, the pain seemingly intensified.

With most of the cases on record, the indication, so far as treatment is concerned, is complete rest of the part until entirely healed. Galvanism has been used in some cases with good results, as has also massage carefully given. The wound should be dressed aseptically, and such general treatment as will keep the system in good condition without jarring the injury should be used. Hot and cold treatment proves very beneficial.

The following is the report of a case which came under my care in February, 1899:—

Mrs. B——, aged forty-six, applied for X-ray examination Feb. 18, 1899, for supposed sarcoma of the right hip. The time of exposure was but fifteen minutes with the static machine. On the third day following the exposure, the patient noticed a slight itching in the right groin, which became more and more intense each day. Some days later a few small vesicles appeared, and the skin looked dark. The patient did not consider this serious, so did not call a physician, but thinking it might possibly be erysipelas, used bichloride fomentations and hot and cold applications, with no apparent relief.

Two weeks from the time of examination, I was called and found the patient suffering intense pain. The pain was of a tingling character, and the itching was intense. At this time there appeared a dark bluish-red spot, about the size of a twenty-five-cent piece, on the lower part of the right side of the abdomen, a short distance from the pubic bone. A few days later the skin sloughed off, leaving a raw surface. This enlarged until at the end of six weeks it was as large as one's hand, irregular, and extending over the lower part of the abdomen and groin to the upper part of the thigh. This appeared much like the raw surface of any burn, with a very dark border surrounding it. There was most intense pain in the wound and itching around it until entirely healed. At times the patient would have relief from the intense pain, but only for short intervals. All the various external applications used for ordinary burns were used without any apparent relief; indeed, the remedies seemed only to intensify the pain. Almost constant applications of hot and cold, using the fomentations three minutes and the ice compress half a minute, gave more relief than any other remedy. The deep soreness continued

until the wound was entirely healed, May 24, a period of three months and five days from the time of examination.

After the wound was healed, the old disease gave some pain in the hip, for which galvanism was used, the positive current being applied to the hip and the negative to the stomach, affording much relief. The patient took long walks with ease, and reported that she had not felt so well for three years.

She continued apparently well until the middle of August, when she again felt slight soreness in the right groin, this increasing until the 6th of September, when she again applied for treatment, and the hot and cold spray was used. The pain increased until September 16, however, when she was obliged to resume her bed. During the period of apparent absence of the disease, there was no itching or irritation of any sort. The wound now appeared red, and a small scab formed and came off, leaving a raw sore about the size of a dime, having in its center the appearance of a slough. This was in the upper part of the thigh, just below Ponupart's ligament. The red surface was about two inches in diameter; the skin looked dark and angry. The pain was intense and of a tingling character, coming on in paroxysms, and lasting from one to three hours, though not always so severe for the entire time. Fomentations applied to the wound gave some relief. After two weeks cold hip packs at 65° were used with very good results, the pain being relieved and the patient quieted. Later, ice compresses were used with good effect. The hot spray at a temperature of 120° gave some relief. The cold spray caused intense pain. The hot and cold revulsive spray was then used, provoking intense pain during the application, but giving relief afterward. Iodine was applied around the wound, thus acting as a counter-irritant, and affording some relief. For a time the patient could not lie on either side on account of severe pain, and when lying on the back there was a nervous twitching and jerking of the limb, which produced a jarring of the wound, thus causing intense pain. This was relieved by the cool leg pack at a temperature of 80°; a foot bath and heat to the sacrum sometimes gave relief. Local faradization to the sacrum and feet gave some relief. The pain was of a burning character, covering the entire surface of the wound.

A few weeks after the first slough appeared, a second one, somewhat smaller, appeared about an inch from it, and a few weeks later another very small slough appeared.

The foregoing method of treatment apparently gave better results than any which had previously been used, and it was energetically employed until the wound was entirely healed, Feb. 1, 1900. From this time until the present, there has been no evidence of a return of the old trouble.

Don'ts in Connection with Heart Disease.— Don't feel called upon to give digitalis as soon as you hear a murmur over the heart. Study and treat the patient, not the murmur.

Don't conclude that every murmur means disease of the heart.

Don't forget that the pulse and general appearance of the patient often tell more than auscultation.

Don't neglect to note the character of the pulse when you feel it. Possibly you may look at the tongue to satisfy the patient; feel the pulse to instruct yourself.

Don't think that every systolic murmur at the apex indicates mitral regurgitation; every systolic murmur at the aortic interspace, aortic stenosis. The former may be trivial; the latter may be due to atheroma of the arch of the aorta.

Don't say that every sudden death is due to heart disease.

Don't forget that the most serious diseases of the heart may occasion no murmur. A bad muscle is worse than a leaky valve.

Don't examine the heart through heavy clothing.

Don't give positive opinions after one examination.— *Philadelphia Medical Journal.*

Scholarships of the American Medical Association.— In accordance with Dr. Keen's recommendation in his presidential address, the trustees of the American Medical Association have established a fund of $500 to be expended annually for the encouragement of scientific research, but no sum given to any individual at one time shall exceed $100.

TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

TREATMENT OF TABES DORSALIS.

WINTERNITZ (*Blätter Klin. Hydro.*, September, 1899) writes: "According to my rich experience in dealing with tabes dorsalis, hydriatic treatment forms the most efficacious curative agent. Neither very cold nor very warm baths, nor vigorous mechanical means should be employed. The variation of temperature is confined to a very slight range. For that reason, as soon as I am able to diagnose with certainty an affection of the spinal cord, I apply almost exclusively the half bath. In determining the temperature, I follow certain indications. If the pains are intense and frequent, I recommend a temperature of from 81.5° to 76° F., and continue the bath from eight to ten minutes. In this case the body is not rubbed in the bath, but is subjected to kneading or massage, followed by an affusion to the back. If, however, the pains are only moderate, I graduate the bath from 81.5° to 72.5° F., with a duration of six to eight minutes. The explanation of the efficacy of these mild baths in so grave a disease seems very plausible.

"Tepid water exerts an adequate stimulation on the peripheral nerve ends to influence the central nervous system in a moderate degree, and to produce a direct change in the condition of the nutrition of the spinal cord by promoting an increased activity of the vasomotors. This advantageous change may occur in the following manner. It is generally known that active processes can seldom be considered an anatomical cause of the diseases of the spinal cord. It is only in the first stage of these diseases, often not even in this stage, that hyperemia exerts a more important influence. Greater importance must be attributed in diseases of the central nervous system to the anemia of the small vascularization, the vessel compression by interstitial exudation, the hypertrophy of the connective tissue, the swelling of the neuroglia, and the edema of the tissues. These inflammatory processes, by hindering the circulation and producing vessel compression, themselves induce anemia, hypertrophy of the connective tissue, fatty degeneration, and atrophy.

"The decrease of the tension of the pulse in ataxia, which was proved by means of the sphygmograph by Erlenburg and confirmed by Charcot, makes it sufficiently credible that a moderate obstruction of the blood current can produce a considerable disturbance of the circulation, and a diminished blood supply to the diseased spinal cord. It is therefore the duty of the therapist not to diminish, but to increase the blood supply to the diseased organs; not to effect an active or passive hyperemia or congestion, but to accelerate the blood movement in the central nervous system, which will of itself improve the abnormal condition of nutrition in the diseased cords. Further, he must raise the decreased blood pressure and permanently maintain its elevation. An increased tonus of the vessels will induce an acceleration of the circulation under otherwise equal circumstances.

"We can realize to-day better than in the past that we are better able to accomplish this by means of medium, rather than extremely high or low temperatures. Too high temperatures will produce a still greater diminution of tension in the already relaxed peripheral vessels, and by producing hyperemia of the skin and subcutaneous tissues, effect a revulsion from the deeper lying organs and consequently from the cerebrospinal axis. The disturbance of nutrition in the diseased organs would not thereby be ameliorated, but directly deteriorated. Too low temperatures will have the same effect, increasing the blood supply in the periphery, and draining the blood from the internal organs, thus producing anemia of the central nervous system. Too great stimulation of the nerves in these diseases also seems to be detrimental, since we have to do with a nervous system which is hypersensitive in consequence of the disease. We must, therefore, avoid the changes which produce so great benefit in rheumatism, in peripheral nervous diseases, and other affections; and select neutral temperatures, which produce no greater stimulation of the nerves, but are rather efficacious by retarding stimulation, and yet maintain by a temperature amply below blood heat a moderate and constant elevation of blood pressure and an advantageous influence on the action of the heart, which facilitates an accelerated blood

movement through the spinal cord, and thus lessens the disturbances of nutrition in chronic diseases of the cord.

"Charcot has called our attention to the acceleration and lessened force of the heart action in most of these affections, and Von Liebig in his treatise "Observations Concerning Pulse and Body Temperature in the Tepid Bath" (*Medical Intelligencer*, 1878) has demonstrated that the action of the heart is slowed and invigorated by baths at the moderate temperatures above described. These statements, made twenty-five years ago, concerning the treatment of locomotor ataxia I have to modify but little. I still most frequently employ the half bath. I have, however, shortened the duration of the baths. I apply the colder at a temperature of 77°–72.5° F. for three minutes; the warmer at 86°–80.6° F. for four or five minutes at the most.

"Almost all persons suffering from locomotor ataxia wear stimulating bandages, especially applied to the stomach during the night, since this bandage generally produces better sleep and rest, and betters the digestion, and the functions of the bladder. The number of the single procedures during twenty-four hours depends upon the constitution of the individual and upon special indications. Torpid persons need a more frequent repetition of the stimulating effects than very excitable persons. I prescribe frequently, especially during the hot season, a half bath early in the morning and also in the afternoon. When it is necessary to avoid cold applications striking the whole body surface, I apply only local procedures and employ colder temperatures. I also bear in mind that the success of the application depends not only upon the number of sensible nerve endings touched, but also upon the area selected. I can, for instance, by means of a very intense stimulation (by a cold foot bath or a vigorous fan douche applied to the feet) energetically irritate the very anesthetic soles of the feet, in a certain case, without exciting the spinal cord more than sufficiently to better the nutrition. For lightning pains I have applied the most varied physical methods of treatment, but have not always been able to stop the pains. When they were limited to but few places, I frequently succeeded in removing them or mitigating their intensity by means of closely applied, alternate very hot and very cold compresses; first as hot as the patient can endure, followed by very cold.

"The most tormenting complications belong to the various attacks designated as crises, gastric, laryngeal, cardiac, etc. So long as we are not able to influence the process itself, physical and dietetic measures are here often tried fruitlessly; therefore in the attacks of pain and organic crisis, I always employ the half bath, selecting the higher temperatures and longer duration.

"In my hydropathic establishment I have treated more than one thousand cases since 1865, and have had the opportunity of treating about seven hundred cases repeatedly during the course of several years. I have seen the most favorable results in the complete restoration of the so-called acute ataxia in young individuals. Four of six cases were completely cured. In two of them the patellar reflexes have again returned; in the two others, in the most advanced stage of ataxia, the reflexes were sometimes present, but since pupillary symptoms were absent in the last two cases, I do not count them as genuine tabes dorsalis. I observed that in the real chronic sclerosis of the posterior columns of the cord, in the majority of cases the diseased processes were checked for a long time or were improved during years and even decades. I have recently treated cases which had showed no alteration for several years, by combining the hydriatic procedures with Frænkel's gymnastic exercises.

"Overwork and fatigue must be avoided. I am convinced that this has been the cause of several failures in the treatment of locomotor ataxia, as I have already mentioned that a sufficient stimulation will produce corresponding parallel impulses in the vasomotors, but overirritation and excessive functionating paralyzes the nerve cell and prohibits its nutrition. These anomalies of metabolism and nutrition are, I think, causes of many deteriorations which could mostly be avoided by proper treatment. No diminution of the functions of the organs should be observed after baths or gymnastic exercises. When the patient feels a weariness or lassitude after any procedure, he has not experienced a nerve irritation corresponding in temperature, duration, and form; or his condition after the stimulation was not good, and therefore the reaction was

insufficient. It may also be possible that for some reason the vasomotor system was not sufficiently impressed, and that the stimulated nerve cell was thus left without sufficient nutritive material to utilize the stimulation properly. The attending physician must consider all causes of an incomplete reaction in order to modify temperature, duration, form, and procedure after each bath until a sense of comfort, an invigoration of the heart action and of the circulation, and an improved condition of the body is produced. This is sometimes very difficult, requiring an exact observation and knowledge of the therapeutical methods. Some hints may be useful in this respect:

"In grave cases of ataxia and in far advanced stages of tabes dorsalis, the half bath can not always be used in the beginning.

"One is restricted to partial washings, which he applies in bed, in the morning. Such patients must await the reaction in bed, with the window open.

"Methodical deep breathings are helpful.

"Sometimes the administration, before local applications, of some kind of warm nourishment, milk or soup, is sufficient to produce a comfortable feeling and objective improvement.

"Light massage of the whole body, sometimes a few gymnastic exercises, according to Frænkel, in the bed, facilitates a good reaction.

"One may soon proceed to the half bath, which must be varied according to time, temperature, duration, and mechanical irritation. There are but few failures with this method of treatment. The great majority of tabetics are more or less cured by such hydriatic treatment methodically applied, improvement in all symptoms in most of the patients being the rule, and permanent functional cures frequently occurring."

Surgical Diseases of the Spanish-American War.—Senn (*Austin Flint Medical Journal*) gives a brief statement of some of the principal facts observed by him in Cuba and Porto Rico. One thing notable was the readiness with which the Mauser bullet wounds healed and the limited zone of contusion. Many of the soldiers who suffered from flesh wounds hardly noticed them at the time. The value of the first-aid dressing and the aseptic character of the bullet were also notable. Wound infection, he thought, was generally due to the too frequent dressings, and useless attempts at probing the wounds. Another notable point was the number of gunshot wounds of the abdomen in which the patient recovered without laparotomy. He was the first to place himself on record, basing his opinion on the results of experiments, that a man shot through the abdomen from before backward, on the level with the umbilicus or above, has a fair chance of recovery without operative interference. In these cases the intestinal canal not infrequently escapes injury. These are the cases that recovered during the late war, and in almost every instance the wound was on the level with or above the umbilicus, while if it was below that point, the chance of intestinal wounds was greatly increased. In penetrating wounds of the chest, the same was true as regards recovery without operation, and in but few did he find even extensive pneumothorax. There were no subjective or objective symptoms indicating injury, and recovery generally followed within a few days. He believes that too early aspiration in cases of chest wounds may increase hemorrhage, and this procedure is justified only after the accumulated blood in the pleural cavity has fulfilled its legitimate functions, and served the purpose of an efficient hemostatic by effecting pulmonary compression, or after sufficient time has elapsed and there is no danger of recurrence of the internal bleeding. One part of the surgical treatment of the wound was unsatisfactory, and that was lack of early immobilization of fractured limbs, which was partly due to want of proper materials. The most valuable available material was the cocoa-palm leaf, which was found to be most excellent. He regrets that immediate immobilization was not practiced on a larger scale. Another statement was that, in contrast to early experience, penetrating wounds of the knee joints, hip joints, and larger joints recovered promptly without loss of function. He does not think that more than four hundred lives were lost in battle or as the result of secondary complications of gunshot injuries. The loss of life was due to typhoid and tropical diseases, such as malaria, etc. Another thing of which he is positive, so far as the Illinois troops

were concerned, is that there was not a single case of hernia sent to the front, but many came back with such troubles. He thinks this is due to the reflex interference of climate and the disappearance of fat in the region of the inguinal canal. He examined 10,000 men at Camp Tanner, and found varicocele very frequently — in at least twenty-five per cent of the applicants. In not more than two per cent did the recruit acknowledge that he experienced any inconvenience whatever, and he now believes, judging from observation of men who returned, that it is not a serious disqualification for military service. Patients who required treatment of this condition after active service, suffered from the same causes as those which produce hernia.—*Journal of the American Medical Association, July 21, 1900.*

Hydriatrics in the Prophylaxis and Treatment of Pulmonary Tuberculosis.— The use of water as a therapeutic agent is probably not as general as it should be, and it would appear that this measure would be especially indicated in cases of chronic disease attended with impaired nutrition and wasting. The problem in the treatment of tuberculosis is essentially one of nutrition. While the tubercle bacillus is the exciting cause, the conditions must be rendered favorable for its invasion and multiplication. The prophylaxis will, therefore, consist principally in measures directed toward rendering the conditions unfavorable, and the treatment should have the same aim. To this end it is believed that hydriatric measures intelligently employed are capable of materially contributing. They find an ardent advocate in this connection in Professor Winternitz, of the University of Vienna, who has had an enormous experience in this field of therapeutics, and who discusses (*Berliner Klinische Wochenschrift*, 1900, No. 18, p. 348) some of the indications for and the rationale of their employment. He points out that tuberculosis does not develop suddenly. Deficient innervation, impaired circulation, various nutritional disturbances, especially gastric and intestinal disorders, anemia, etc., predispose to its occurrence, and every agency that antagonizes these conditions possesses prophylactic value. Ordinary cold water acts as a powerful tonic, improving the appetite, increasing the weight, enriching the blood, augmenting muscular power, stimulating innervation, and accelerating metabolism. It antagonizes retrogressive and favors constructive metamorphosis. It fortifies the body against the undesirable effects of cold. The systematic training of the sensory peripheral nerve terminations and of the vasomotor nerves overcomes the great susceptibility on the part of the tuberculous patient to catarrhal affections. Cold water exerts a beneficial influence upon the local morbid process in the lungs, inducing increased activity in the flow of the blood to and from these parts, and improving the circulatory conditions generally. These results are brought about by invigorating the action of the heart and improving the tone of the vessels and the tissues, inducing collateral or active hyperemia in the affected organs, and strengthening the entire organism, particularly innervation and circulation. Hemoptysis, hectic fever, and night sweats are also favorably influenced by hydrotherapeutic measures. The plan of procedure pursued by Winternitz is directed to securing prompt and complete reaction from temperature as low as can be borne, in conjunction with appropriate mechanical and chemical irritation. Stimulating affusions are also applied over the diseased parts, and thermic and mechanical symptomatic treatment is directed toward the fever, the night sweats, hemoptysis, and cardiac and circulatory manifestations.— *Editorial, Jour. Am. Med. Asso., July 21, 1900.*

Damage from Alcohol.— Dr. Herschell, of London, in his recent work on "Health Troubles of City Life," writes as follows of alcohols as stimulants:—

"Stimulants never increase the natural capacity of the brain. They can only abstract for the purpose of work in hand some of the energies which are sorely needed to repair and restore a brain which has already been taxed to the furthest limit consistent with health. To remove the sense of fatigue caused by overwork by the consumption of alcohol is to close one's ears to the voice of nature. The weariness of the brain is a protest against further exertion until recuperation has been obtained by rest; and if the weary feeling is deadened or destroyed by ad-

ventitious means, nature will exact her penalty.

"When the overworked man of business, having been on his legs all day, and feeling fit to drop, with a sensation of all-goneness about the region of the stomach, rouses himself with whatever he is in the habit of taking, be it whisky, champagne, or even tea or coffee, he does not add one atom of force to his stock of energy, although he fancies he does, but having put to sleep his sense of weariness, simply appropriates some of his reserve for the present necessity. He has accepted a bill at short date to which a ruinous rate of interest is attached, and his resources will not allow him to make many repetitions of the experiment. His account at the bank of life will soon be withdrawn. Alcohol can not add one iota to his reserve of nervous energy, but it may delude him into exhausting it. The busy man should once for all rid himself of this fancy that he can create by artificial means an abnormal store of brain power. He can not enlarge the limit which nature has set up."— *Quarterly Journal of Inebriety, July, 1900.*

Examination of the Blood: Its Value to the General Practitioner.— At the recent meeting of the American Medical Association, M. Howard Fussell read a paper on this subject, in the Section of Practice of Medicine. He said that in some cases the blood examination is as important and in other cases it is more important than the examination of the urine, and it is already acknowledged that an examination of the urine is necessary in every case. As a general practitioner, the author examines the blood in all obscure cases. As a result of such an examination: (1) The physician will avoid administering iron to a patient because the face is pale, since all pale people are not anemic; (2) it will be found that patients with flushed faces often have decided reduction of the hemoglobin and of the number of red blood corpuscles; (3) patients with cardiac and pulmonary symptoms are sometimes diagnosed as cases of organic disease when a blood examination would reveal chlorosis; (4) blood examination will positively indicate the presence or absence of malaria; (5) the diagnosis between leucemia and other organic conditions, such as tuberculosis and carcinoma of the stomach, may be made; (6) the blood examination, combined with the Widal test, will diagnose between typhoid fever and malaria, or, possibly, show a combination of the two diseases; (7) counting the leucocytes will often give satisfactory results of clearing up obscure conditions. The physician does not need to take a microscope to the bedside of the patient; if the diluting tube is surrounded by a rubber band, the blood may be preserved for a long time, and the counting may be done at leisure.

A Simple Method of Fixing Blood Films.— Alexander Edington, M. B. (*Br. Med. Jour.*, July 7, 1900), uses the vapor of formic aldehyde for fixing blood films. He makes use of a bell-jar which is open at the top. The diameter of the jar is 135 m. m. and the height to the lower border of the neck about 150 m. m. The opening at the top is closed by an India-rubber cork at the bottom of which is glued an ordinary cover-glass.

When in use, the dry cover-glasses which it is desired to fix, are laid upon a glass plate and covered over by the bell-jar. The cork is removed and a drop of formalin is placed on the attached cover at its lower end, and the cork immediately replaced. The covers, which must be quite dry, are left exposed to the vapor for fifteen minutes or more, but not longer than thirty minutes, after which they will be found to be well fixed. In order to obtain the best results the films must be made thin, as thick films are liable to crack.

Centenarians.—According to the Indiana *Medical Record*, more people over one hundred years old are found in mild climates than in the higher latitudes. According to the last German census, in a population of 55,000,000, only 78 have passed the hundredth year. France, with a population of 40,000,000, has 213 centenarians. In England there are 146; in Ireland, 578; in Scotland, 46; in Sweden, 10; in Norway, 23; in Belgium, 5; in Denmark; 2; and in Switzerland, none. Spain, with a population of 18,000,000, has 401 persons over one hundred years of age. Of the 2,250,000 inhabitants of Servia, 575 have passed the century mark. It is said that the oldest person living is

Bonno Cotrim, born in Africa, and now living in Rio de Janeiro. He is 150 years old. A coachman in Moscow has lived for 140 years.—*Journal of the American Medical Association, July 11.*

Some Conclusions Arrived at after a Study of One Hundred and Ten Cases of Pernicious Anemia.— Dr. Richard C. Cabot, of Boston, read a very interesting paper on this subject, before the Association of American Physicians at their fifteenth annual meeting held in Washington, D. C., May 1, 2, 3, 1900. In his cases there had been fifty-seven males and fifty-three females. Only four cases had followed parturition. Late middle life predisposed toward it, as shown by the fact that in eighty-two of his cases, the patients had been over forty years of age. He thought that pernicious anemia was much more frequent than the text-books would lead one to suppose. Some cases had come to him which had previously been diagnosed as tuberculosis. He thought that there was very little, if any, relation between the menopause and pernicious anemia. It had nothing to do with syphilis. Hemorrhage was quite common, especially of the nose and gums. He spoke of the striking constancy of the symptoms in almost all of the cases, even in some of his so-called mild ones; *viz.*, muscular weakness, dyspnea, gastrointestinal disturbance (paroxysmal diarrhea). The appetite had been poor in all but three cases, and in these it had been ravenous. In two thirds of his cases there had been a temperature of 99° or 100° F., and even higher. The urine in fifty-three cases had been normal, while others had had a trace of albumin with granular casts. Nervous symptoms had not been constant. Some cases had had myelitis. As to the blood, the white corpuscles were subnormal; the number of red corpuscles was 2,500,000. The diameter of the white corpuscles was greater than normal. The proportion of lymphocytes was relatively high. Dr. Cabot said that there was no relationship between the symptoms and the blood condition. The average duration of this disease was from one to two years. The longest-lived case he had was five years. All treatment, he thought, was hopeless, unless the use of laxatives would be of service, working along the line of Hunter's idea, that of gastrointestinal toxemia. Dr. Cabot thought that arsenic did little if any good in these cases.

American Medical Missionary College.— From the College Number, August, 1900, of the *Medical Standard*, we quote the following: —

"A little over a year ago this college graduated its first class of twenty-four members, after a four years' course. Of this number, twenty-two are engaged in work in sanitariums, or in home or foreign missions. This result can probably not be duplicated by any college in the land. The school is unique in its labors of this kind. Members of any denomination are admitted to its courses, and in case of restricted means, may receive assistance from a medical missionary board in cases where they engage in missionary work under its direction. The college was incorporated under the laws of the State of Illinois on July 3, 1895. It is located at 1926 Wabash Avenue and 28 College Place. Although incorporated in this State, all the work of the first two years is done at Battle Creek, Mich., except dissecting. Sixteen weeks of the junior year and twenty of the senior are spent in Chicago for the benefit of larger clinical privileges.

"The attendance and requirements are sufficient to indicate that it is filling an important place in college work. The fact that its chief object is to equip medical missionaries mentally is sufficient to guarantee that it was not founded for advertising purposes or to bestow the empty title of 'professor' on a favored few.

"The requirements for admission compare favorably with larger schools. Two years of some modern language will be required after September, 1901. Already a five-years' course is offered to those who wish to avail themselves of more thorough preparation, although only four years of nine months are required. During the year just completed, one hundred and ten students were enrolled. There were twenty-four seniors.

"It is expected that a new college building will be erected in the near future. Dr. J. H. Kellogg, the superintendent of the Battle Creek Sanitarium, is president, and Professor of Surgery and Principles of Rational Medicine."

Opium in Infancy.—T. D. Crothers, M. D. (*Jour. A. M. A.*, May 19, 1900), calls attention to the injurious effects on the adult organism of opium taken in early life. Opium and its alkaloids seem to have two distinct effects on the nerve centers and organism of infancy. Its sedative action is in the nature of palsy. Cell functions and growth are slowed, retarded, and finally changed. The changes following long-continued doses become permanent. The symptoms of dullness and stupor continue in lessened vigor and degrees of imbecility and mental perversion in later life. The freedom from pain, and forced sleep with apparent steadiness of nerve force react in increased irritation and instability, with greater sensitiveness to all surroundings. Nearly all persons who have been injured in infancy and early childhood by these drugs manifest these two characteristics. Increased dullness and stupor, or nervous irritation and instability, often both, may be combined in one. Beyond these are disorders of the nervous system and digestion, with low power of control, and subject to morbid impulses that are largely uncontrollable. Opium and its alkaloids, given to healthy children occasionally for some special purpose, are in all probability without injurious effects. In unhealthy, neurotic children, with defective ancestors and evident imperfect development, the increased degeneration which follows the use of opium, is clearly from this source. Where this drug is combined with other remedies and given a long time, the effects are the same. They can not be lessened by the action of other drugs. No form of opium should be given to infants or children for more than a day at a time. While the effects of continuous sedation may be overcome by correct living, the cell injury and perversion of function is never repaired. The growth and development of other organs may do much to overcome in part and cover up the injury, but the defects will appear from the presence of the slightest exciting cause. The presence of nervous dyspepsia, which begins soon after puberty, and early in middle manhood becomes a most distressing disease, is often traceable to the free use of opium in infancy and early life. Early and profound exhaustion from slight overwork or excitement, seen in young persons, indicating low vitality and feeble nervous organism, is the result of opium-taking early in life. Early precocity, or failure to sustain the expectations created, has been noted in the cases of early addiction. The many constitutional defects and degeneracies which appear after puberty and in early manhood should create an inquiry concerning the early therapeutics and drugs given in childhood; the ignorant mother who uses soothing syrups freely to suppress the irritations of the infant is not the only offender. The routine and often thoughtless physician who uses opium freely in infantile prescriptions are responsible in many ways for the wrecks of later life.—*Am. Jour. Obst. and Diseases of Women and Children, August, 1900.*

Typhoid Fever from Infected Vegetables.—The State Board of Health of Massachusetts has conducted an investigation of an outbreak of typhoid fever in a public institution, a hospital for the insane, at Northampton, Mass., and demonstrated that the disease was spread by celery raised on the premises. On Sept. 10, 1899, after practical immunity for ten years, cases began to be reported, and in fifteen days thirty nine cases occurred. It was discovered that while patients, nurses, and servants were attacked, the non-paying patients were exempt. Both classes of patients received practically the same kind of food, but the paying patients had occasional allowances of extras, like fruit and certain vegetables, and at this time had been receiving celery raised in beds which were watered with filtered sewage. This had been given out not only to the paying patients, but to the nurses and farm hands as well. After the blame was placed, and orders issued that no more of the celery should be used, one of the farm hands ate some, and within ten days came down with the disease. As soon as its use was discontinued, the number of cases began to diminish.

Another outbreak of a similar character was reported by Dr. Ferre (*Annales d' Hygiène Publique et de Médecine Legale*, January, 1899, page 23), by whom it was investigated. This was in a girls' school at Jurancon (Basses-Pyrénées) which was attended by day pupils as well as by boarders. The drinking water was exonerated, and the food supply inculpated by the fact that while both classes used the water, only the boarders were seized. It

was shown that the vegetable garden supplying the school was watered with the contents of the cesspool which received the evacuations of all.—*American Journal of the Medical Sciences, April, 1900.*

Alcoholism among Children.—From the *Quarterly Journal of Inebriety*, July, 1900, we quote the following: "The German authorities at Bonn made an investigation upon alcoholism among pupils in primary schools, which shows a startling state of affairs. Sixteen children out of one hundred did not drink milk, and absolutely refused to drink it because it had no savor. Of 237 pupils seven to eight years of age, there was not one who had not drunk wine, beer, or whisky, although twenty-three per cent of these children were given a glass of whisky every day by their parents, that they might become strong. As a result of these investigations, it was proved that children most accustomed to alcohol showed least intelligence; children who had their morning glass of whisky and found no savor in milk, showed great inattention during the morning hour. A curious fact shown by this investigation was that young girls who took whisky with their breakfast were more numerous than young boys.

Medicinal and Non-Medicinal Remedies.—Page (*Medical News*, May 26, 1900) refers to the tendency so prevalent at the present time to overtreat disease. He is of the opinion that altogether too much stress is laid on the treatment of disease by drugs alone, and that special emphasis should be laid on other methods. In case the author was restricted to one method, he would adopt hydrotherapeutic measures for the treatment of all diseases, and drugs alone would be his last choice. He calls attention to the lack of education in our medical schools along the lines of hydrotherapy and massage, which are of more importance than drug therapy.

Carbonic Acid Gas in the Treatment of Dysentery.—A. Rose, M. D. (N. Y. *Medical Journal*, July 14, 1900), strongly recommends the use of carbonic acid gas in the treatment of dysentery. "Dysentery itself, or at least at the outset, is a local disease confined to the mucous membrane of the rectum. Carbonic acid gas has the most remarkable healing effect on the diseased mucous surfaces of the rectum in particular. The gas acts at once by anesthetizing, relieving the tenesmus which characterizes dysentery, and stimulating the circulation, thereby relieving inflammation, and healing ulcerations. By means of this topical application, we may often dispense with the roundabout way of administering medicine *per os*, while at the same time this gas inflation is a more effective means than the well-known aqueous or starchy enemas, certainly a more rational one."

Symptoms of Dilatation of the Stomach.—Drs. J. H. Musser and J. D. Steele conclude that the most reliable symptoms of motor insufficiency and gastric dilatation are (1) food and fluid in the stomach in the morning when no food has been eaten since the night before; (2) evidences of fermentation and toxemia resulting from the production of fermentation or decomposition. They also mention the ready entrance of fluid through the gastric tube, and scanty return flow, scanty urine, and the absence of visible peristalsis as other symptoms of importance.

Dilatation, as stated by these observers, was found very common among students. The cause they believe to be weakness of the muscular walls of the stomach, resulting from chronic gastritis, which is the natural consequence of the common use of tobacco and alcohol by students.

Cinnamon in Tropical Dysentery.—Wilkinson recommends the use of cinnamon bark in tropical diarrhea. The cinnamon is employed in teaspoonful doses, a little milk being used to mold it into a bolus, which is chewed. The dose is administered night and morning. It claims to have been found of value also in tropical dysentery.

Death from Burns.—E. Scholz, by a series of experiments, has proved that death following burns is due to the development of waste products in the blood as the result of the influence of heat upon it. It was observed that death did not occur when the skin was rendered bloodless before scalding, whereas burns of the same character applied to the skin in the ordinary condition were fatal.

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

The Diagnostic and Therapeutic Importance of Tubercle Bacilli and other Bacteria in Sputa.— L. Brieger (*Berlin Klin. Woch.*, March 26, 1900) in this article comments on the positively known data in regard to the examination of sputa in tuberculous individuals. Some of his conclusions are as follows: Constant expectoration containing large amounts of tubercle bacilli denotes the presence of cavities. Clump formation of granular tubercle bacilli signifies their tendency to destruction. Periods during which the sputum is rich in bacilli, alternating with periods when the sputum contains them only sparingly, signifies that previously open cavities have become closed, so that their contents can not be expectorated. The so-called acid-retaining bacilli have been determined by Kemper to be the cause of gangrene of the lung. The importance of the influenza bacillus in connection with tubercular processes of the lungs is now being recognized. The bacillus pyocyaneus and the micrococcus tetrogenus are found frequently; the former probably plays a part the same as the pus-producing organisms in mixed infection. The presence of the latter, according to Koch and Gofftsy, renders the prognosis *quoad vitam* very unfavorable. The author believes that the organisms found in the mouth play an important part in the mixed infection form of tuberculosis, so that as a prophylactic measure the mouth should always be treated as a possible source of infection. The good results of all inhalation methods of treating tuberculosis, as well as the mask treatment with aromatic oils, are explained by their action upon the bacteria contained in the mouth and upper air passages.— *Medical Review.*

The Toxin of the Gonococcus.— V. J. Maslovsky (*Ann. de Gyn. et d' Obst., January*) has conducted a series of experiments with gonococci and the toxin of the gonococcus in regard to their action upon the peritoneum and uterine mucosa. As a result of these researches he concludes that the effect of cultures of the gonococcus upon the animal organism is due, not to the development of the gonococcus, but to the influence of a toxin which it produces. This toxin causes a general and a local reaction. The general reaction is shown by a rise of temperature, a loss of weight, and sometimes death of the animal. The local action— inflammation and suppuration—occurs in subcutaneous cellular tissue, as well as in the anterior chamber of the eye, the peritoneum, and the uterine mucosa. This action of the toxin may explain the increase in size of a pyosalpinx, the pus within being sterile. The gonorrheal infection takes place; the ends of the tube become closed; the gonococci, after causing suppuration, are carried off by leucocytes or die, forming toxins. This toxin in the tube continues to cause formation of pus, although living germs are absent. It may also cause localized peritonitis about the tube.

Typhoid Bacilli in Drinking Water. — A positive result, said to be the first instance in which the isolated typhoid organism responded to every test, including growth on gelatin, potato, litmus milk, bouillon and glucose bouillon, agglutination, and Pfeiffer's test with animals, has been reported by Drs. Kübler and Neufeld (*Zeitschrift für Hygiene und Infectionskrankheiten*, 1899, XXXI, p. 133). The contamination of the well, the water of which had caused a small local outbreak, was traced to the urine of a typhoid patient whose vessel was emptied near the well. That the contamination was not of fecal origin was evident from the absence of the colon bacillus. Four weeks from the time of the discovery of the organism, a second examination was made. On this occasion, bacilli were found which responded to all the tests except Pfeiffer's, this exception being attributed to modified virulence.— *American Journal Medical Sciences, April, 1900.*

The Cultivation of Ameba.—C. O. Miller (*Medical Review*) reviews the literature on the subject of ameba cultivation, and presents his own observations. The great difficulty in the cultivation of the ameba is to isolate it from bacteria.

Some cultures contain amebæ and bacteria, while others contain fungi, algæ, flagellata. The fungi were eliminated by exposing the cultures to a temperature of 37° C., the algæ by placing the cultures in the dark, inasmuch as some amebæ encyst, and are not killed by drying. Advantage was taken of this fact to separate them from those organisms that are killed by drying. Some cultures were kept alive in the dry state as long as six years. Amebæ are best transported when dry. The drying process should be carried out gradually. A few of those cultivated by this method were the ameba spharocystis, characterized by rounded pseudopodia and an active flowing motion of the protoplasm; the ameba irregularis, characterized by forming cysts that are irregular in outline; the ameba radiosa, resembling that of Ehrenberg; and the cochliopodium billimbosa of Lesser and Hertwig.

A New Medium for the Growth and Differentiation of the Colon and Typhoid Bacilli.—Mac Conkey (*Lancet*, July 7, 1900) gives the composition of this medium as follows: Sodium glycocholate, 0.5 per cent; peptone, 1.5 per cent; lactose, 0.3 to 0.5 per cent; agar, 1.5 per cent; and tap water, q. s. The lactose is added after filtration. Stab cultures made with the colon bacillus become cloudy in twenty-four hours, while those made with the typhoid bacillus remain quite clear. This reaction is due to the following facts: (1) The salts of bile are precipitated by acids, and (2) the colon bacillus produces acid in the presence of lactose, while the typhoid bacillus does not. The medium has a marked inhibiting effect upon the growth of ordinary soil and water organisms.—*N. Y. Medical Journal, July 21, 1900.*

Flies as Carriers of Infection.—Victor C. Vaughan, in his oration on "State Medicine," before the fifty-first annual meeting of the American Medical Association at Atlantic City, N. J., June 5 to 8, 1900, stated with reference to this subject as follows:—

"My reason for believing that flies were active in the dissemination of typhoid fever during the late war may be stated as follows: (1) They swarmed over infected fecal matter in the pits, and then visited and fed on the food prepared for the soldiers at the mess tents. In some instances where lime had recently been sprinkled over the contents of the pits, flies with their feet whitened with lime were seen walking over the food. (2) Officers whose mess tents were protected by means of screens suffered proportionately less from typhoid fever than did those whose tents were not so protected. (3) Typhoid fever gradually disappeared in the fall of 1898, with the approach of cold weather and the consequent disabling of the fly. It is possible for the fly to carry the typhoid bacillus in two ways. In the first place, fecal matter containing typhoid germs may adhere to the fly and be mechanically transported. In the second place, it is possible that the typhoid bacillus may be carried in the digestive organs of the fly, and may be deposited with its excrement."

Adaptation of Pathogenic Bacteria to Different Species of Animals.—T. Smith (Boston *Medical and Surgical Journal*) divides those infectious diseases which man shares with the lower animals into four classes: (1) Diseases presumably transmissible, *e. g.*, bubonic plague, tuberculosis; (2) diseases not known to be transmitted, *e. g.*, actinomycosis, tetanus; (3) diseases transmissible from animal to man, but not from man to man, owing to interfering conditions, *e. g.*, anthrax, glanders, etc.; (4) certain symbiotic diseases requiring two hosts for the full life cycle of the micro-organism, *e. g.*, malaria, trichinosis. In addition to these there are certain bacteria which are closely related to each other, cause disease among different species, *e. g.*, the tubercle bacillus, which infects birds, animals, and man, yet each is a variety of its own. It seems likely that the virulent germs of to-day become so only after passing through other forms of animals in former geological ages, and perhaps even now forms are developing in unseen habitats which some day will appear and give rise to a new disease.—*Medical Review.*

Diphtheria Bacilli in Dejecta.—Schoedel (*Muenchener Medicin. Woch.*, June 26, 1900) has discovered diphtheria bacilli in the stomach and intestines, and also in the feces of two patients suffering with diphtheria. He calls attention to the danger of infection from the dejecta.

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THE RATIONAL TREATMENT OF PNEUMONIA.

SIR HERMANN WEBER, in a recent article in the *Practitioner*, gives some interesting summaries respecting the results of different methods of treatment pursued in Bonn and in London in the treatment of pneumonia. The mortality is higher in Bonn than in London, being from fourteen to seventeen per cent, while in London the death-rate is twelve to fourteen per cent. The remedies recommended are blood abstraction and tartar emetic, opium, and salicylate of sodium. One would not expect to see a very great difference in the results, whichever one of these remedies might be employed.

It is very strange indeed that the profession is so slow to lay hold of the powerful therapeutic means offered by hydrotherapy for combating this disease. It has been shown again and again by statistics of undoubted reliability that the mortality in pneumonia may be reduced to four or five per cent by the judicious use of hydriatic measures. The cooling compress (applied at 60°, changed every fifteen to forty minutes), the prolonged neutral bath (88°–94°), and especially wet-sheet packing prolonged to the sweating stage have been shown to be therapeutic measures of the highest value in the treatment of this grave malady.

The writer had a good opportunity to observe the value of the hydriatic method of treating this disease a few months ago, on the occasion of a visit to Old Mexico. While spending a short time at the Guadalajara Sanitarium, Guadalajara, Old Mexico, we were asked to visit a Mexican gentleman who had been sick with pneumonia for one week. He had employed six physicians, and had finally been given up to die. We found the patient extremely low,— pulse 146, respiration 44, temperature 104½°. The patient was so feeble that he could barely whisper, his lips were blue, and the skin cyanotic. Shortly after we first saw the patient he became so wildly delirious that four men were required to hold him in bed. He had had no sleep whatever for several days.

Vigorous hydriatic treatments were at once employed. The means consisted chiefly in a short fomentation to the chest every three or four hours, followed by the heating compress at 60° and changed every twenty minutes. Cold mitten friction (for description, see MODERN MEDICINE for May) and the cold towel rub administered every two to three hours. The wet-sheet pack was applied and continued until evidence of perspiration appeared. The patient fell asleep during the second application of the pack, and awoke with his mind olear. At the end of three days, convalescence was established, and the patient made an excellent recovery.

It is interesting to note that so eminent an authority as Sir Samuel Wilkes (*Practitioner*, February, 1900) condemns the employment of digitalis, asserting that it will not lessen the pulse except when given in injurious doses. He also condemns blisters on the chest, and speaks disparagingly of the use of cold, but evidently because it has not been properly used. Continuous cold to the chest is not to be recommended in pneumonia, but intermittent cold applications, such as the cold compress applied at 60° and allowed to remain from fifteen to forty minutes, or a sufficient length of time to become warmed by the body heat, are exceedingly valuable. By this means the tendency to stasis in the pulmonary vessels is antag-

onized, and leucocytosis is encouraged. With each application of cold, the blood vessels are contracted, and the lung is, so to speak, squeezed, and the blood vessels are emptied of their contents. As the compress warms, the blood vessels, of the lungs relax, and new blood flows in, bringing with it a fresh supply of leucocytes. By this means a continuous procession of fresh leucocytes is supplied to the lungs, passive congestion is antagonized, the vital resistance of the tissues is increased, the temperature is lowered, the heart action is sustained, and the healing powers of the body are thus aided in the restoration of the patient. Insomnia, cerebral congestion, delirium, and elevation of temperature are easily combated by means of the wet-sheet pack. In cases of hyperpyrexia, a cooling pack may be employed. In this the wet sheet is renewed several times, the duration being lengthened each time. The first sheet is changed at the end of eight or ten minutes, the second at fifteen minutes, the third after twenty minutes. The patient is allowed to remain in the fourth sheet until reaction is complete and perspiration is encouraged, although the pack should not be continued longer than from one to two hours, even if perspiration does not appear. The pack is especially valuable in cases of this sort, for the reason that it congests and stimulates the skin, thus relieving both the pulmonary and cerebral congestion.

Hydrotherapy certainly affords the most rational measures for the treatment of pneumonia. With the extension of the practical knowledge of hydriatic methods, the mortality may be reduced to one third or even one fourth the present rate.

THE DIETETIC TREATMENT OF DILATATION OF THE STOMACH.

ALBU recommends a fluid instead of a dry diet. Milk is especially recommended. Beef, pork, and all fats are prohibited. The following is the bill of fare recommended: 8 A. M., a cup of milk, 2 rolls; 9 A. M., a cup of cream; 10 A. M., 2 soft eggs; 11 A. M., a cup of cocoa with milk; 12 M., a saucer of cereal food; 1 P. M., ¼ lb. sweet bread, to which is added 3 tablespoonfuls of spinach; at 3 P. M., a cup of milk; at 4 P. M., a cup of chocolate with zwieback; at 5 P. M., a cup of cream; at 6 P. M., a saucer of oatmeal soup with egg or 4 tablespoonfuls of minced meat; at 7 P. M., a cup of milk with a roll; at 8 P. M., a cup of milk; and another at 9 P. M. After each meal the stomach is massaged.

The writer states that he has made fifty observations. Some of the patients got well. That any recovered, would seem miraculous. Thirteen meals in one day, within a period of thirteen hours,—practically a meal every hour! We have omitted to mention that massage was practiced in the morning and afternoon, which, with the mechanical emptying of the stomach by massage, was doubtless the only thing that rendered existence possible under such a system of incessant stuffing.

The writer holds with Albu that patients suffering from dilated stomach may be satisfactorily treated by means of a fluid diet. Either a fluid diet or a dry diet may be successfully employed in these cases, but both can not be employed together, that is, at the same meal. The method which the writer prefers is to administer four meals daily, at the hours of 9 A. M., 12 M., 3 P. M., and 7 P. M. The first and third meals are dry, the second and fourth are fluid. Of fluid food the patient may be given kumyss, buttermilk, concentrated and sterilized milk, cream diluted with barley water, and fruit purées. Baked sweet apples are wholesome. For the dry meals, zwieback, well-cooked and roasted rice, toasted granose biscuit, grānut, and other dextrinized foods are especially serviceable. Trommer's Extract of Malt and similar

preparations are useful as foods in these cases. The unpleasant taste is the only objection to their use. In malt honey, or meltose, this objection is overcome. All cereal foods eaten in cases of this sort should be well dextrinized, so as to insure prompt digestion and complete liquefaction in the stomach. By continued feeding, the gastric glands become exhausted, having no opportunity for recuperation.

HYDROTHERAPY IN INSANITY.

In a paper published in the *American Journal of Insanity* (January, 1900), Dr. T. W. Foster calls attention to numerous pathological features presented by neurasthenia and insanity, and makes a special plea for the employment of hydrotherapy in the treatment of the insane. The great value of hydrotherapy in the treatment of neurasthenia has been well recognized, especially since the prominence given to the cold spinal douche by Charcot in his great work at the hospital Salpêtriere. The neutral bath, the wet-sheet pack carefully administered, especially after proper heating of the skin, and various forms of derivative treatment, such as the leg bath and the sitz bath, the moist abdominal girdle, the wet-sheet rub, the cold towel rub, spinal douches, and other measures whereby powerful thermic impressions can be made upon the skin or efficient derivative effects induced, are of far greater value in dealing with various forms of functional insanity than all the drugs known to medical science. This the writer knows from actual experience in the treatment of cases of this sort, which he has had constantly under his care for the last twenty-five years. He has had the pleasure of seeing many cases considered hopeless make an excellent recovery. A single case will illustrate the value of one of these simple measures: The patient was brought to the institution of which the writer has charge, in a condition of wild delirium. He was a large man, and two nurses were constantly required to control him. He had had no sleep for several days and nights. After a prolonged neutral bath at 94° for nearly two hours, this patient was put in a wet-sheet pack, in which he fell asleep, and obtained several hours of most refreshing rest. A few hours later the pack was repeated, with like effects. After two or three days the patient's condition was so wonderfully improved that his friends scarcely recognized him. The neutral bath operates in relieving cerebral excitement by cutting off all external stimuli and lessening the sensibility of the cutaneous nerves. The wet-sheet pack operates in the same way, and in addition, by stimulating the skin, diverts blood from the brain to the periphery.

An interesting fact which it is worth while to keep in mind is that the skin is capable of holding from one half to two thirds of all the blood in the body. By congesting it we may at any time relieve an overfilled brain, or the liver, stomach, or other viscus of its surplus blood.

The Influence of Butter upon Gastric Digestion.— Wirschillo, an eminent Russian physician, has, according to *Wratch*, recently conducted a series of experiments for the purpose of determining the influence of dairy butter upon the secretion of gastric juice in children. His observations agree with those of Pawlow, who previously showed that fats diminish the activity of the gastric juice by lessening the amount of hydrochloric acid and pepsin produced. We have in this fact a clear explanation of the well-known fact that the free use of fats gives rise to biliousness. Biliousness is simply a condition in which foods are retained in the stomach for too long a time and undergo fermentative and putrefactive changes. The poisons produced are absorbed into the system, and give rise to the well-known symptoms which accompany a bilious attack.

THE DECEPTIVE INFLUENCE OF ALCOHOL.

THE great diversity of opinions with reference to the value of alcohol as a therapeutic agent has been the means of stimulating various investigators to determine the true therapeutic action of alcohol on the human body. Formerly alcohol was classified as a stimulant of the highest value. To-day it has its place along with the sedatives, and is classified with chloroform, ether, and other depressants. Less than a decade ago alcohol in some form was ranked as one of the first remedies in typhoid fever, pneumonia, and other acute infectious diseases. A glance at the medical literature of to-day shows that there has been a decided change in the opinion of physicians with reference to the value of this drug in the above-mentioned disorders.

The reason for such a universal use of alcohol in the treatment of disease seems to be attributable to the fact that the drug is deceptive in its action. This is borne out by the well-known fact that alcohol, when ingested, causes the individual to feel warm, while in reality the opposite is true,—the body temperature is lowered. In this case empiricism would say that alcohol was a valuable aid to increase the temperature; scientific investigation, however, shows us that this is not so. The increased amount of blood in the skin, which is due to the depressing influence of alcohol on the vasoconstrictor nerves, allowing the vessels to increase their caliber, causes an increased amount of heat to be given off from the body, thereby lessening the internal temperature, even while the individual, because of the stimulation of the peripheral sensory nerves by the increased amount of blood, is conscious of a feeling of increased warmth.

Another fact worthy of mention is that the heat-regulating mechanisms within the body are influenced by impulses which start from the peripheral sensory nerves. An application of cold to the skin causes increased oxidation, with an accompanying increase of temperature. An application of heat to the same organ causes a decrease in the amount of oxidation. The latter is what really takes place when alcohol is ingested. The increased amount of blood due to the dilatation of the peripheral vessels acts on the sensory nerves of the skin, and thus the impression of heat is given to the nerve-endings, which in turn send impulses to the heat-regulating centers, and thus the amount of heat being produced is lessened.

In a lecture recently delivered by Victor Horsley (*Med. Temp. Rev.*, May, 1900), the lecturer brought out several points which clearly demonstrate the deceptive action of alcohol. In this lecture, which was on "The Action of Alcohol on the Brain," he took up the subject under three heads:—

"1. The way in which alcohol affects ideation, or the process of forming ideas. This was the basis of all mental operations. He showed how fibers connected all parts of the brain together so that it acted as a whole. It was desired to find out whether the brain as a whole worked as well with alcohol as without. One way of testing this was by testing the reaction time, the length taken in perceiving a given signal. This had been done by Kraepelin most thoroughly, and he showed the apparatus and exhibited the method of working it. Kraepelin found that the time of reaction was shortened for a few minutes, but this was quickly followed by a lengthening of it. He further tried a more complex experiment, showing a signal with a number on it which was not to be signaled back unless it was above ten. This took longer, involving association of ideas, and was from the very first prolonged by alcohol. Kraepelin had found that when he tried various association-experiments, such as addition, subtraction, with and without alcohol, he used to think that he had done them more

quickly with it until he looked at the recording apparatus and found he had been deceived. Professor Horsley said that chloroform, ether, nitrous oxide, and similar narcotics acted in the same way. He had some years ago tried the effect of nitrous oxide gas on himself. He set himself to write the figure 3 repeatedly in two rows, thus :—

"3 3 3 3
3 3 3 3

"The writing of 3 was automatic, but it needed thought to write them. Thus, as the gas took effect, the 3's became less legible, and the rows mixed up and soon ceased as unconsciousness set in. As he recovered, the assistant told him to write again, and this time he began badly, but all the 3's were in a single row. The short interval of unconsciousness had sufficed to obliterate from his memory the thought of writing in two rows. Alcohol had a like effect, and could blot out very definite intellectual operations.

"Secondly, he dealt with the effect of alcohol on voluntary movement. He showed by an experiment that energy was given out in a succession of impulses; it was impossible to lift a weight steadily, and there were tremors which could be demonstrated. Even moderate doses of alcohol gave rise to tremors. Alcohol produced a dissolution of the nerve centers. Kraepelin had tried the action of alcohol on muscular power by means of the pressure dynamometer, which was squeezed at regular intervals. After a rest, alcohol was taken, and at first there was a little increase, soon followed by a notable decrease; under the influence of tea there was no decrease at all. The cause of the preliminary increase was not at present explainable, but was probably due to a paralyzing of the brake action or resistance to movement, the first indication of loss of control, and was really a proof that there was a paralyzing action from first to last. He showed a diagram constructed by Dr. Aschaffenberg, representing the amount of type set up by certain compositors in a quarter of an hour before and after taking alcohol. The amount was made less by alcohol."

C. E. S.

REVIEWS.

HYGIENE AND PHYSICAL CULTURE FOR WOMEN. — By Anna M. Galbraith, M. D., Fellow New York Academy of Medicine; Attending Physician Neurological Department, New York Orthopedic Hospital and Dispensary; Late Attending Physician and Instructor in Diagnosis and Clinical Medicine Woman's Medical College, New York Infirmary; Former Gynecological Clinician and Assistant Attending Staff for Diseases of Women, Woman's Hospital of Philadelphia, etc., etc.

Dodd, Mead & Company, New York, 1895.

"Yea, all that a man hath will he give for his life." Job 2 : 4.

In this volume of 300 pages, the author has discussed in a concise and comprehensive manner the principles of anatomy, physiology, and hygiene which have a bearing on the acquisition and maintenance of physical perfection. These subjects are treated in a simple and pleasing manner, and they can be studied with profit by every woman. That such a work is a necessity is patent to everyone who is at all familiar with the vast and increasing multitude of physical deformities found in woman.

The work is calculated and is well adapted to arouse woman to extend her studies along the lines above mentioned, and to stimulate her to lend her influence toward the education of her sex in these lines so that they may be "emancipated from the bondage of invalidism." To the author is due the gratitude of womankind for her painstaking efforts in placing within their reach such a valuable work.

THE RAND MC NALLY ATLAS OF CHINA, Containing Maps and Descriptive Matter Pertaining to General Conditions and the Present Crisis in the Celestial Empire, and a Concise Review of its History, Government, Religion, People, Industries, and Relation to Foreign Powers. Illustrated. Rand-Mc Nally & Company, Printers and Publishers, 166 & 168 Adams St., Chicago.

The Battle Creek Sanitarium

LABORATORY OF HYGIENE.

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F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, M. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR JULY.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
103 per cent	6	2	8
100 " "	124	61	185
98 " "	3		3
95 " "	11	15	26
93 " "	22	33	55
91 " "	1		1
88 " "	11	10	21
85 " "	10	22	32
83 " "	3	3	6
78 " "	8		15
71 " "	3	5	8
Below 70	4	6	10
Total	206	164	370

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	69	25	94
Between 4,500,000 and 5,000,000	54	43	97
" 4,000,000 " 4,500,000	36	50	86
" 3,500,000 " 4,000,000	32	25	57
" 3,000,000 " 3,500,000	6	11	17
" 2,500,000 " 3,000,000	6	8	14
Below 2,500,000	3	2	5
Total	206	164	370

Examination of Sputum.— There were 50 examinations made, 33 being new cases. Tubercle bacilli were found in 4 cases.

Gastric Laboratory.—

	Hyperpepsia. Cases	Hyperpepsia. Per Cent	Simple Dysp. Cases	Simple Dysp. Per Cent	Hypopepsia. Cases	Hypopepsia. Per Cent	Total. Cases	Total. Per Cent
Without bacteria	43	90	20	91	93	64	156	72
Less than 10,000 bac	5	10	2	9	19	13	26	12
Between 10,000 and 100,000 bac					9	6	9	4
More than 100,000 bac.					25	17	25	12
Total	48	100	22	100	614	100	216	100

The patients were received from the following States and countries: Michigan 25; Indiana, 20; Illinois, 15; Ohio, 13; Wisconsin, 11; Kentucky, 11; Missouri, 10; Texas, 10; Iowa, 9; Pennsylvania, 9; Louisiana, 7; Colorado, 5; Kansas, 5; District of Columbia, 5; Arkansas, 5; New Mexico, 3; Alabama, 3; New Jersey, 3; Minnesota, 2; Florida, 2; Mississippi, 2; New York, 2; Tennessee, 2; Georgia, 2; Maryland, 2; West Virginia, 1; South Dakota, 1; Washington, 1; Canada, 1; Honduras, 1; Argentine Republic, 1; Bonacca, 1; unclassified, 26. Total, 216.

Urinary Laboratory. — The total number of specimens examined, 900; number of new cases, 360; number of cases having albumin, 38; sugar, 8; casts, 5; blood, 10; pus, 159.

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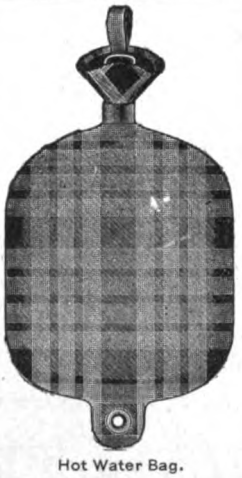
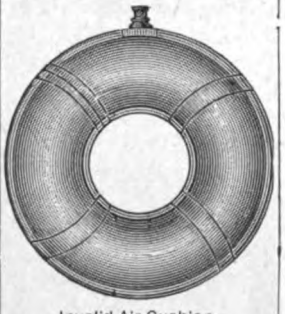
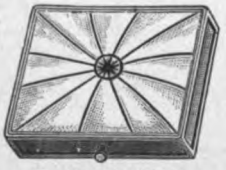


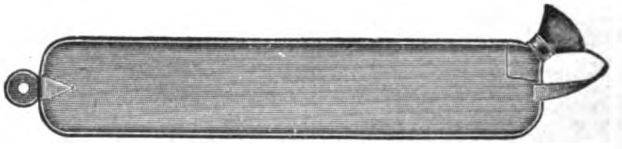
Hot Water Bag.



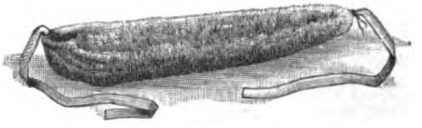
Invalid Air Cushion.



Carriage Cushions.



Spine Bags, 20-inch, postpaid	$1.15
" " 26-inch, postpaid	1.40
Hot Water Bags, white rubber, postpaid	1.15
" " " flannel covered, postpaid	1.40
Universal Syphon Syringe	1.14
Invalid Air Cushions, 9-inch in diameter, postp'd	1.70
" " " 12-inch " "	2.00
" " " 15-inch " "	2.50
Air Pillows, No. 1, sateen cover, 9 x 13 "	1.75
" " No. 3, " " 12 x 18 "	2.65
Safety Syringe, postpaid	.42
Ear Syringe, postpaid	.20
Breast Pump, postpaid	.64
Rubber Bed-pans, round	3.35
" " oval	4.35
" " oval, with outlet tube	4.85
Stomach Tubes, postpaid	1.60



Natural Flesh Brush, postpaid	.30
Wet Abdominal Girdle, postpaid	1.75
Carriage Cushions, sateen cover, 14x16, postp'd	5.50
" " " " 16x16, "	6.50

Invalid Chair Cushions,	Seat.	Back.	
No. 1, sateen cover	16x16	16x16	7.50
No. 2, " "	16x16	16x18	7.75

GOOD HEALTH PUB. CO.,

BATTLE CREEK, MICH.

MODERN MEDICINE

VOL. IX. BATTLE CREEK, MICH., U. S. A., SEPTEMBER, 1900. NO. 9.

ORIGINAL ARTICLES.

COLD FRICTION.

BY J. H. KELLOGG, M. D.,
Superintendent of the Battle Creek (Mich.) Sanitarium.

By the term "cold friction" is designated a procedure which consists in the application to the surface of the body of a series of partial wet rubbings, one part after another being taken in systematic order until the whole cutaneous surface has been gone over and has been brought into a condition of vigorous reaction.

Requisites.—A vessel containing a few quarts of cool, cold, or very cold water (ice water may be employed in many cases); a mitt consisting of rough material of some sort,—ordinary rough linen or Turkish toweling is not desirable. Coarse mohair answers fairly well for the purpose; but the best fabric is a closely woven woolen cloth resembling haircloth, but slightly rougher to the touch, which is manufactured in Egypt and Turkey, where the writer became acquainted with it in the Turkish baths of Cairo and Constantinople. It is there used for a sort of preliminary shampooing applied after the sweating process is completed and before the application of soap. This material possesses just the right degree of roughness, stimulating the skin without irritating it, and is so closely woven that it may be made to hold just the right amount of water for the purpose for which it is designed. A Turkish sheet and one or two towels are also required.

APPLYING THE COLD FRICTION MITT.

Method.—The patient is undressed, and lies upon a bed or a massage couch wrapped in a Turkish sheet. First of all, the head, face, and neck should be wet with cold water. If the hair is not saturated (women often object to this), a napkin wet with cold water should be placed over the face. The vessel containing the cold water is placed at one side, near the head of the couch; the attendant places the mitt upon the right hand, and then uncovers a small portion of the patient's body, preferably the arm, and taking the patient's hand with his own left hand, he dips the mitt into the cold water, then proceeds to rub the arm, rapidly going over the whole surface, redipping the mitt as soon as warmed, and continuing until the skin reddens. A towel is then thrown about the arm, which is quickly dried and spatted. The other arm is then treated in like manner, then in succession the legs, the chest, the back, the hips, and back of the legs, and lastly the feet. The soles of the feet should be spatted, not rubbed.

This application is graduated by the temperature and the degree of saturation

of the mitt,—"moist mitt," "wet mitt," and "filled mitt." The mitt is first saturated with water, then well wrung, and slipped on the hand. For the "moist mitt" the palmar surface is merely touched to the surface of the water; for the "wet mitt," the hand covered by the mitt is quickly dipped in the water two thirds its length, then shaken to remove surplus water; for the "filled mitt" the whole mitt is immersed and filled with water, and quickly carried to the part to be treated; the water flows out while the surface is being rubbed, and the effect is thus almost as vigorous as that of the half bath, only that it is partial in its application, and hence may be employed in cases in which the shock of a cold application to the whole surface simultaneously would be injurious through producing visceral congestion or excessive excitation of the brain.

By this means it is easy to bathe a fever patient with ice water or water at a temperature of 35° to 45° without the production of shock or other undesirable effects, while securing the tonic effect upon the heart and the increase of general vital resistance, which are the most desirable effects.

In cases in which cold is positively contraindicated, hyperemia of the skin may be induced by hot mitten friction, using water at as high a temperature as possible.

This method, which the writer has systematized and introduced within the last year (1899), he has found among the most useful of all cold applications, both as a tonic and as an antipyretic. One of the great advantages of the method is that it lends itself so readily to all the various conditions arising in the treatment of pathological states.

Physiological Effects.— The act of rubbing the surface produces mechanical effects similar to those from the impact of water under pressure, as in the douche, although the effect is certainly much less pronounced than that of water at the same temperature in the form of the douche; however, a much lower temperature may be employed with cold friction than with the cold douche (32° F.), and hence the reaction induced may be even more powerful, and according to the author's observation, is more quickly secured, than with the cold douche. Indeed, there is no form of douche, except the writer's percussion douche, which produces so vigorous and prompt reaction as does the cold friction applied with a mitt of proper texture. Reaction occurs with great rapidity in this procedure for the reason that the delay which commonly follows the thermic impression of cold before reaction begins, is prevented by the application of vigorous friction simultaneously with the thermic impression. Circulatory reaction is also stimulated to a high degree, and a large amount of blood is rapidly brought to the skin.

The stimulation of the peripheral nerves induced by cold friction produces most profound reflex effects upon the nervous system, the heart, the glandular structures, and indeed the whole organism. It is a most powerful tonic; hence a regulator of nutrition and a potent vital stimulant.

The friction mitt may be advantageously employed in the rubbing sitz, the rubbing shallow, or the Brand bath, and all other forms of cold baths in which rubbing is desirable. In mixed applications of this sort it may be advantageous to employ a mitt for each hand. In general, however, the bare hand is better in these cases, as its warmth helps to secure the circulatory reaction which is one of the essential objects of the application. The use of the mitt somewhat intensifies the thermic effect of the bath.

Therapeutic Applications.— Cold friction may be locally applied over any part desired. When applied to the lower extremities, for example, the effect is revulsive or derivative. Cold water applied to the precordial region with friction influences the heart in a powerful manner. Cold friction applied to the back and scalp powerfully stimulates the cerebral functions.

Cold friction is indicated in all cases requiring tonic applications; hence it is invaluable in neurasthenia, and especially with very feeble neurasthenics who are either too weak to receive the douche, or too exhausted to react to this powerful tonic procedure. Cold friction affords the best of all means for training patients to endure the contact of cold water with the surface. It has no equal as a measure for graduated hydriatic training.

This procedure may be advantageously employed in cases of anemia, chlorosis, in all forms of wasting disease, as tuber-

culosis, and in convalescence after fevers; in cardiac dropsy, as a means of stimulating the peripheral circulation; in anasarca from renal disease; in chronic toxemia accompanied by spasm of the peripheral vessels; in all cases of cardiac insufficiency; in febrile conditions, to reduce temperature, whenever cold in any form is indicated. It is a hydric measure of remarkable versatility, and may be employed in a vast variety of cases. There is no measure of greater value than cold friction in the treatment of tuberculosis pulmonaris. The application may be made twice daily with advantage, a temperature of 75° being used at first, and steadily lowered day by day until 35° can be readily endured. The "moist mitt" should be used. As it is the tonic effect which is especially desired, care should be observed that each surface treated is made to glow with vigorous reaction before proceeding to another part. This prevents pulmonary congestion.

Cold friction affords an excellent means of testing the ability of a patient to react. In fevers, it presents an excellent test for the state of the heart, and even affords a valuable means of prognosis. Great slowness to react, the parts remaining cold and pale, indicates excessive irritability of the vasomotor centers or nerves. This condition, which is commonly present in anemia, especially in grave cases, is often a cause of great difficulty in securing reaction. When present in acute fevers, vascular spasm is a positive indication of diminished heat elimination, and suggests at once the necessity of employing some means to increase the peripheral circulation, such as the short, hot-blanket pack, hot immersion for three or four minutes, fomentations to the spine, or some other heating process, to be followed by cold friction, and is a contraindication for prolonged cold baths. When the skin is very slowly reheated after an application of cold water, a mottled blue appearance remaining, the indication is great feebleness of the thermogenetic functions of the body, or diminished power of calorification. In fevers, this condition indicates impending collapse.

Cold friction must be mentioned also as a measure more or less indispensable in typhoid fever in aged persons, children, and diabetics, and in this disease when complicated by ataxic and adynamic conditions; in dicrotic pulse, stupor, subnormal temperature, pregnancy, puerperal fever, also in chronic dysentery, malarial fever, coma from any cause, whooping cough, yellow fever, plague, dengue, influenza, lithemia, leprosy, emaciation, scurvy, rickets, purpura, anorexia, hypopepsia, intestinal catarrh, chronic nephritis, hysteria, neurasthenia, Bell's palsy, migraine, chorea major, paralysis agitans, and morphia and other drug habits. A cyanotic skin is always an indication for cold friction preceded or followed by heat, if the patient is very feeble.

When frequently repeated or prolonged hot applications are required, cold friction should be employed every two or three hours, or at least two or three times a day, to maintain cardiac tone and general vital resistance.

Contraindications.— There is scarcely any condition in which the cold friction mitt may not be employed. There are almost no contraindications, except cutaneous lesions, in which wet-towel friction should be substituted.

A NEW GASTRIC DOUCHE.[1]

BY MAX EINHORN, M. D.,
New York.

DOUCHING of the interior of the stomach with water under considerable pressure was first applied therapeutically by Malbranc, principally in cases of gastralgia. For this purpose Malbranc[2] employed the ordinary apparatus used for gastric lavage, with the only difference that the funnel was held up quite high. Ewald[3] devised a very large funnel holding about two quarts of water, which when raised still more increased the pressure. In both instances the ordinary stomach tube was used. An improvement in this method of douching the stomach was accomplished by Rosenheim[4] and Boas,[5] who constructed a special tube for this purpose, provided with a great number of very small openings at the end. The apparatus, however, has this drawback, that if the tube is pro-

[1] Reprinted from the *Medical Record*, Dec. 2, 1899.

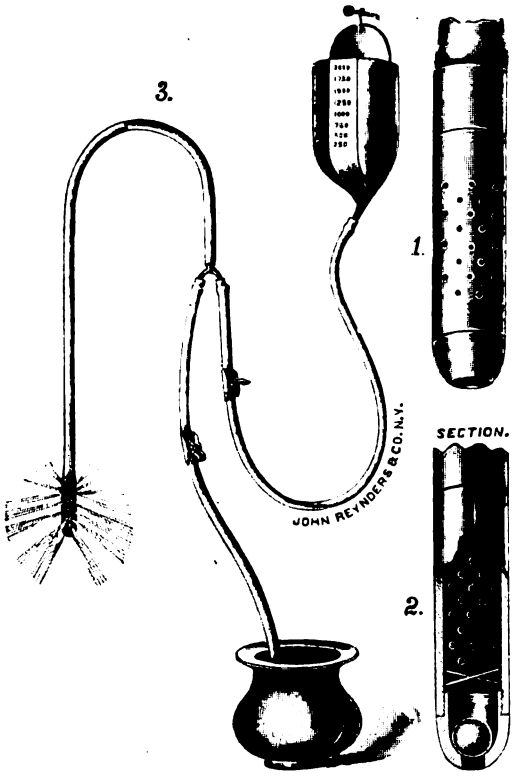
[2] Malbranc: *Berliner klinische Wochenschrift*, 1878, No. 4.

[3] Ewald, C. A.: "Diseases of the Stomach," 1897, p. 99.

[4] Rosenheim, Th.: "Ueber die Magendouche." *Therap. Monatshefte*, 1892, and *Berliner Klinik*, 1894, Heft. 71.

[5] Boas, T.: *Krankheiten des Magens*. Theil 1, p. 311.

vided with small openings only, the water when admixed with mucus can not easily return, or will come back without the mucus, which remains in the stomach almost as if it had been filtered. If the tube, on the other hand, has besides the very small openings a large one, the water will, of course, run out principally through the latter, and thus no douching will be effected. The douche described by J. W. Bell[6] acts in the same way. It



resembles the Rosenheim douche with the exception that a pumping ball is inserted in the middle. In order to avoid the difficulties mentioned, M. Gross[7] and F. B. Turck[8] have constructed gastric douches which are provided with a double-current tube. The inflowing tube has numerous very small openings at the end, while the outflowing tube is provided with one very large opening at its extremity. The inflowing tube thus effects a good douche, while the outflowing branch permits the water to return easily. Such an apparatus undoubtedly admits of a thorough douching of the stomach. The double-current tube, however, has the disadvantage that its size is quite considerable, and its introduction into the stomach of the patient is not very convenient.

In order to have an apparatus which can be introduced without any inconvenience, and which will at the same time allow a thorough douching of the stomach, I have constructed a new gastric douche. Its principle is based upon a valve arrangement. The apparatus consists of a rubber tube, not too flexible (thickness three eighths of an inch, length twenty-six inches), at the end of which a hard-rubber capsule is attached (Fig. 1). The latter contains numerous very small openings all around, and one very large opening at its lower extremity. Within the capsule, which can be screwed apart, lies a small aluminum ball. This moves easily and freely within the capsule, and when it lies above the lower opening, it entirely occludes the same. Two cross bars in the capsule prevent the entrance of the small ball into the tube (Fig. 2). If the tube described is attached to an irrigator provided with a waste pipe, the apparatus is complete. If the waste pipe is closed, and the water made to run through the douche, the liquid will press the ball downward, thus closing the large opening. The water will then come out through the small side openings like a very fine shower, sprinkling over quite a large area (Fig. 3). The inflowing tube being closed, and the waste pipe opened while the capsule is inserted into the liquid, the latter will push the ball upward, and thus the large opening will be free, and the water will easily return through it. The liquid will certainly return not only through the large opening, but also through the numerous small side openings. While these, however, do not admit the return of coarse particles, the latter will easily be able to pass through the large hole.

Method of Using.— The douche end of the apparatus is dipped into warm water, and then inserted into the stomach. It is necessary to pay attention that the capsule lies immediately below the cardia, and is not situated deep in the stomach. The length of tubing from the mouth should be sixteen and one-half to seventeen inches. It may be useful to

[6] Bell, J. W.: "A Combined Stomach Tube and Douche." The *Medical Dial*, September, 1899, p. 296.

[7] Gross, M.: "Double-Current Gastric Douche." *Medical Record*, 1895.

[8] Turck, Fenton B.: "Recurrent Gastric Needle Spray or Douche." Cited from Hemmeter, "Diseases of the Stomach," p. 287.

make a mark at this point of the tube. The tube is now attached to the irrigator, the outflowing pipe closed, the inflowing one opened, and the stomach sprinkled with about a quart of water. In order to make the water return from the stomach, the tube is inserted a little farther into the stomach, from four to six inches, the outflowing pipe opened, and the inflowing one closed. The liquid from within the stomach now returns. This procedure may be repeated three or four times. The temperature of the water should be regulated according to the therapeutic indications. The douche may also be connected with two irrigators, one containing cold, the other warm water; the stomach may thus be sprinkled alternately with cold and warm water.

I have used the above-described gastric douche since the beginning of this year in many cases, and can say that it can be applied without any difficulty, and works well. I therefore do not hesitate to recommend it for general use in douching the stomach.

AMEBIC DYSENTERY: REPORT OF A CASE.

BY CHAS. E. STEWART, M. D.,
Battle Creek (Mich.) Sanitarium.

MR. G. C. P., an American, a laborer in a stave factory, aged nineteen, single, applied for treatment June 21, 1900. When a child he had measles and whooping cough; otherwise enjoyed good health until the age of seventeen, when he contracted pneumonia, from which he fully recovered.

During August, 1899, he had intermittent attacks of diarrhea. During the attacks he suffered from very severe cutting and griping pains in the abdomen; there was also much distress after eating. For the relief of the diarrhea he took a great deal of medicine, with no apparent benefit. The attacks became more frequent, until finally there was no period in which the stools were not diarrheal in character. At first they were of a yellowish color and mushy in consistency; later they became more fluid, and were discolored with blood. From the patient's description of the feces, evidently considerable mucus was present. Later on in the course of the disease the fecal matter became more watery, and contained lumps of mucus; the color was that of beef water. The number of stools in twenty-four hours varied a great deal. During the first part of his illness, the number of stools varied from sixteen to twenty-four; later on they became less frequent, and during the last six months before coming for treatment, the number averaged from six to eight.

At the time of his application for treatment, a physical examination showed a man of large frame, very much emaciated, slightly anemic, and subcutaneous fat small in amount. There was tenderness over the abdomen on pressure. Both internal and external hemorrhoids were present, the internal ones being of large size and giving him considerable pain at times.

During his illness the patient had lost forty-five pounds in weight, was very weak, and could walk about only with great effort. For a month previously to his coming to the Sanitarium, he had rapidly been losing both in strength and weight, and seemingly could obtain no relief. Of all the measures adopted, that of dieting and rest seemed to be most efficient.

A macroscopic examination of the fecal matter at the time of his arrival showed it to be watery in consistency, containing some blood and a considerable amount of mucus and shreddy material. At times it was pultaceous and had an extremely offensive odor. A microscopical examination revealed red blood cells, epithelium from the bowel, leucocytes, crystals of triple phosphates, and particles of undigested food. No amebas were found on the first and second examinations.

During the first two weeks of treatment, there was continual loss in the patient's strength and weight. At this time he was put to bed, and a bowel catheter passed high into the bowel. Through this a large cleansing enema at a temperature of 104° F. was given. The contents of the bowel were passed into a warm receptacle, and immediately sent to the laboratory for examination. Large numbers of amebas and infusorias were found. The amebas contained both vacuoles and red blood cells, the presence of the latter establishing a diagnosis of amebic dysentery.

Previously the patient had been put on a strict diet of fresh fruit juices, malted nuts, and protose broth. His treatment consisted of fomentations to the abdomen, which effectually relieved the severe pain from which he had suffered almost constantly. The fomentations were followed by cold compresses to the abdomen changed every five minutes, ten changes. These were given for the purpose of allaying the enteritis. Between these treatments, and during the night, a moist abdominal bandage was worn (the *umschlag*). Cold sitz baths, cold mitten friction, and massage were also employed. Cleansing enemas, followed by tannic acid enemas, were administered, but none of these measures seemed to have any influence in reducing the number of evacuations or in the character of the feces. Enemas containing silver nitrate were then used for a short time, but these gave so much pain that they were discontinued.

The day previously to the detection of amebas in the feces, warm injections of quinine (1 to 2,000) were given. These, in conjunction with the hydriatic measures already mentioned, were continued for two weeks. At this time very little, if any, improvement was noticeable as far as the character and number of stools were concerned. Through the hydriatic measures, rest, and diet, the patient gained some in strength and weight. After using the quinine enemas for two weeks, twenty per cent of hydrozone was added to the quinine solution. The first stool after the administration of the hydrozone and quinine enema contained at least two thirds of a pint of mucus, blood, and necrotic tissue. The strength of the quinine solution was increased to 1 to 1,000, and in the course of two or three days, the number of stools, including that passed by enema, was reduced to three in twenty-four hours, and before the end of the week, there was only one stool, and that was partly formed.

During the second week after beginning the quinine and hydrozone enemas, the patient had one normal movement of the bowels each morning, before breakfast. He was now allowed to be out in a wheel chair and to go for a drive. He improved very rapidly, both in strength and weight, having gained twenty-five pounds in flesh. He left for home during September, apparently in perfect health.

During the administration of the quinine enema, the daily microscopic examination of the feces showed no diminution in the number of amebas, but upon the addition of hydrozone they began to diminish very rapidly, and soon entirely disappeared.

Quinine is undoubtedly of benefit in cases of amebic dysentery, but unless there is present some other substance which will disturb the necrotic tissue and plugs of mucus filling the ulcers, the quinine can not gain access to many of the amebas hidden in these undermined ulcers, and as a result the disease may continue indefinitely. Hydrozone is admirably adapted for this purpose, and when used in conjunction with quinine, there is little danger of the amebas escaping, provided it is injected through a bowel catheter and retained for a considerable length of time.

The hydriatic measures previously mentioned are essential in such cases. Fomentations when judiciously used are a valuable means of combating the abdominal pain. Cold mitten friction and massage are excellent measures for increasing bodily resistance, thereby lessening the possibility of the development of liver abscess, which is so liable to occur in such cases.

Study of the Microbe of Ozena.— Mademoiselle M. Robineau (*Thèse de Paris*, 1899) says that the microbe of ozena is a polymorphous bacillus, immobile, unprovided with spores, and unstained by Gram. It often presents filamentous forms. In the nasal mucus of ozenatous subjects it exists in an almost pure form. In cultures it gives off odorous products, but under no circumstances agreeable ones. On the other hand, old cultures give off ammoniacal compounds having the odor of old cheese. The morphological and biological characteristics are identified with those of the bacillus of Friëdlander.— *Canadian Practitioner and Review.*

A New Pathological Bacillus.— Dr. Flechner, a member of the Medical Commission to the Philippines, has discovered a bacillus which he has announced to be almost certainly proved to be the cause of the acute dysentery so prevalent in that country.

TRANSLATIONS AND ABSTRACTS

[The articles in this department are prepared expressly for this journal.]

GLEANINGS FROM THE TUBERCULOSIS CONGRESS HELD IN NAPLES APRIL 25–28, 1900.

PROF. E. LEVY, Strassburg (*Deutsche Medicinische Wochenschrift*, Nos. 20, 22, and 25, 1900), reports that the Congress proved both interesting and profitable. Among the representatives from Germany were Virchow, Gerhardt, Rubner, Loeffler, Senator, Fraenkel, and others; from France, Lannelongue, Landouzy, Courmont; from Austria, Schroetter and Fodor. The following prophylactic measures were suggested: —

Those predisposed to the disease should be carefully watched from early childhood, in order that the proper precautions may be taken, and the necessary procedures employed upon the appearance of suspicious symptoms.

Each child should be given at school a booklet on health and how to preserve it.

The marriage of tubercular individuals should be prevented.

The elevation of the working classes is a matter of chief importance in prophylaxis.

The tubercular should be isolated, their dwellings and effects disinfected, and the bodies of the dead cremated.

Free polyclinics should be established to provide for the early recognition of the disease, and to serve as an adjunct to sanatoria.

Sanatoria should be constructed by the State in sufficient numbers to accommodate all.

Those employed in stables and dairies should undergo examination from time to time, as they are apt to infect not only the stalls, but also the milk.

Railroad cars and other public vehicles should be disinfected, and placards put up in conspicuous places, requesting the public to expectorate in the cuspidors, and not on the floor.

Literature upon this important subject should be distributed among the masses.

Medical administrative authority in all communities should make it obligatory to register every case of tuberculosis.

The destruction of infected animals was recommended, indemnification for which to be made by the State.

Maglieri and Ruata were of the opinion that neglected catarrh of the respiratory tract predisposes to tuberculosis.

A number of interesting experiments were reported, among which were those of Lannelongue, of Paris, who gave the results of his experiments upon animals for the purpose of determining the influence of different climates and atmospheric conditions upon tuberculosis. One hundred and fifty guinea pigs inoculated with tubercle bacilli under like conditions were distributed as follows: Fifty were sent to the country, fifty to the seacoast, and fifty were kept in the laboratory. It was found that those in the country succumbed earliest, those at the seacoast next, and those in the laboratory lived longest. Lannelongue attributes this result to the regular temperature maintained in the laboratory, as well as to the care and attention given those animals.

G. Marcone injected into guinea pigs the milk of one hundred and twenty-six Neapolitan cows, with the result that a positive reaction was observed in one fourth of the cases. He recommends heartily the tuberculin test on cows. In Naples the cows are driven from house to house, in order to demonstrate to the public that they are getting unadulterated milk. On this account, the consumption of "cow-warm," unboiled milk is quite prevalent in Naples.

Spattuzi spoke of the prevalence of tuberculosis in Naples. The old physicians estimated that one sixth of all deaths in Naples were due to consumption. The general mortality here is greater than in other Italian and foreign cities, but the mortality in acute infectious diseases is much lower. In the last twenty-six years, 41,883 persons have died of tuberculosis, while 29,723 have died of all other infectious diseases taken together.

Jemma reported the results of his investigations concerning milk and the dangers lurking therein. Milk containing tubercle bacilli was subjected to a temperature of 100° C. for twenty-five minutes, and then fed to rabbits. These animals succumbed, while control rabbits, which received sterilized milk, lived. The writer concludes that milk from cows which react to the tuberculin test is not to be trusted, even after boiling.

In regard to the diagnosis, Petruschky said that a large proportion of the incipient cases are not recognized by physicians. This is to be greatly regretted, inasmuch as the early diagnosis is of so much importance in the treatment and consequent results. It is the duty of the physician to employ any and all of the diagnostic aids known to science. Tuberculin is the best aid to diagnosis.

Landouzy laid stress upon the examination of the urine and blood in the early diagnosis of tuberculosis. Albuminuria alternating with phosphaturia should awaken suspicion. The chief symptom is fever. He has his patients take a walk of several hours, after which the rectal temperature is noted. A rise in temperature points to the probable existence of phthisis.

Senator advised the most painstaking examination for tubercle bacilli; the inoculation of animals with the suspected material; the agglutination test; the tuberculin injection; leucocytosis of uncertain origin; a persistent localized catarrh of the apex; the use of potassium iodide for the production of artificial catarrh; the presence of tubercular processes in other organs; frequent pleuritis; hemoptysis not otherwise accounted for; coughing and perspiration.

Bozzolo mentioned as early symptoms: Albuminuria that he has noticed for years in advance of lung lesions; tachycardia without other causes; the so-called pretubercular anemia; digestive disturbances; increase of the temperature after exertion; the occurrence of herpes zoster, ophthalmicus, especially in meningitis, and thoracicus in lung lesions.

Ceccherelli (Parma) spoke especially of surgical tuberculosis. Trauma and scrofula seem to prepare the soil for infection. If, however, the soil is brought under perfect conditions for nourishment and development, the growth and development of the tubercular process may be arrested. It is quite possible that tubercular peritonitis is thus improved and cured by laparotomy. Though good results have been observed in the surgery of tubercular affections, it is not always practicable.

De Renzi and Coophad tested the muscle tonus in tuberculosis with the Mosso muscle tonometer. They found that even in the early stages of tuberculosis in individuals otherwise well preserved, the muscle tonus was very much diminished, more so than in like affections.

De Renzi and Boeri, prompted by the claims of Salter, *viz.*, that the sweat of tubercular individuals contains tuberculin and other toxins, the elimination of which has a beneficial effect, made careful observations in this connection. They found that the sweat of phthisical persons caused an increase of temperature in tubercular guinea pigs. A large injection caused collapse and death. The authors maintain, however, that this is not due to the presence of tuberculin in the sweat, for the sweat of healthy individuals causes the same reaction, both in tubercular and in non-tubercular animals. With sterilized sweat, hyperthermia was also produced.

Posner, of Berlin, had collected statistics concerning the frequency and origin of tuberculosis of the genito-urinary system. These were collected from some 1,300 post-mortems. He found the condition much more frequent than is usually supposed. Five per cent of all the post-mortems referred to and thirty per cent of all tubercular bodies showed tubercular affections of the genito-urinary tract. In many cases this was a secondary metastatic affection from some other organ, but often, too, it was primary.

Devoto considered tuberculosis among nurses, and found that in the hospitals of Genoa about twenty per cent die of tuberculosis. In those hospitals receiving no tubercular cases, the percentage was practically *nil.* He recommends as a cure for this evil the proper disinfection of the rooms; nurses should not be permitted to eat or sleep in the wards or the sick-rooms; the nurses should be sent to the country occasionally to recuperate. This matter is not only of importance to the nurses, but also to the patients whom they attend.

Giuffre searched for the cause of the fever in tuberculosis. He classifies the tubercle bacillus among the thermogenic bacteria. As a proof of this he points to the fact that in a liter of glycerine bouillon at a temperature of 37° C., three tenths of a calorie was produced. He recognizes the influence of the nervous system, also, as a factor in the heat production in tuberculosis.

For the therapeutic treatment of tuberculosis, sanatoria are quite generally recommended.

Wolff maintains that the disease may be cured in every climate, and that the regulations and requirements of

the sanatoria must depend in a measure upon the class of people dealt with. Only those things should be given them that they can have upon returning home. Too many conveniences are out of place. There should be plenty of food, and the meals served at regular intervals.

Sersiron said that France loses 150,000 citizens yearly of tuberculosis; in Paris, in 1899, 20,000 persons died. Sanatoria are being established in Paris and other parts of France.

De Renzi, after a discussion of the medical treatment of the disease, says: "A cure can be hoped for only from nourishment, pure air, light, and rest." He is at present making a study of light-therapy.

Kuthy (Budapest) expressed very strong arguments in favor of the employment of hydrotherapy in the treatment of tuberculosis. He would recommend its use not only in sanatoria, but also in private practice.— *St. Louis Medical Review, July 14, 1900.*

SURGICAL HINTS.

In women, severe pains about the breasts, back, or extremities are often due to abnormal conditions about the uterus and its appendages.

In strangulated hernia the pain complained of may be situated in the region of the umbilicus, and has more than once been mistaken for a disturbance due to intestinal colic.

Absence of pain does not always signify that you are not dealing with cancer of the stomach, since it has been discovered that about eight per cent of such cases do not present symptoms.

In hip-joint disease the pain first complained of may be on the inner side of the thigh, or above the patella, or in the popliteal space, or about the knee, wherever the terminal branches of the obturator nerves are distributed.

Pain due to disturbance within the bladder is referred to the glans penis when a vesical calculus is at fault; to the region of the bladder itself when the latter is actually diseased; and to the perineum and rectum when the prostate is at fault. In women, calculus often causes severe bearing-down pains which may be mistaken for those due to uterine causes, and sometimes they have incontinence of urine.

When dressing an aseptic wound, it is well to explain to the patient your reasons for not disturbing it for a long time, or he will think himself neglected. The only reason for the removal of a dressing at an early date is the belief that sepsis may have occurred, or because the dressing has been soaked through by an abundant discharge, or because it has become soiled by feces, urine, or vomited matter, or because it has become displaced, or because it causes pain by pressure, or because there is evidence of secondary hemorrhage.

Do not always blame your suture material whenever you get a so-called stitch abscess. The great majority of these are not at all due to the sutures, but to the fact that there has been an infection due to the existence of noxious organisms in the deeper cutaneous layers, which can not always be removed by the most conscientious scrubbing. Careful washing with green soap and alcohol, followed by a large wet dressing of bichloride applied the day before an operation, will greatly diminish the number of these generally miscalled stitch abscesses.

When using cocaine hypodermatically, it is well to boil the water immediately before using, and to inject the solution while still quite warm. This increases the anesthetic effect, besides insuring an aseptic injection. If normal saline solution is used instead of water for all hypodermatic injections, the pain is much diminished.— *International Journal of Surgery, August, 1900.*

The Influence of Other Diseases upon Cancer.— W. R. Williams (*Edin. Medical Journal*, October, 1898) writes that Lambotte believes that erysipelatous and suppurative affections are found comparatively seldom in cancer patients, and are seldom noted in the anesis of cancer patients. It was for this reason that protection by these diseases against carcinoma was presumed. According to the statistics of many of the largest English hospitals, in 395 extirpations of carcinomatous breast, 10 per cent presented erysipelatous lesions, and at the same time, among 173 patients with wounds of the head, only 4.6 per cent. Williams has thoroughly investigated the preceding dis-

eases of the carcinoma patients who came to his notice, and among 130 patients with cancer of the uterus and the same number with cancer of the breast he found in 18 per cent various kinds of suppurative affections, while they estimated 16 per cent in 75 women with non-carcinomatous tumors. He frequently noticed erysipelas and fever in carcinoma patients, though never combined with its recovery or even cure, sometimes, however, accompanying a speedy death. Retrogressions of carcinoma are given in a series of cases by various well-known observers. Williams believes that the reason for this is a lowered minor resistance; retarded progress and regressions are occasionally seen ante-mortem. To this diminished vitality is probably due the extreme rarity of syphilis in the history of the case of cancer patients; not once did it occur among 165 women with cancer of the breast, and only one among 160 patients with carcinoma of the uterus showed earlier lues. The rarity with which the physically diseased and idiots and prison inmates are attacked with cancer also belongs here.

In respect to infectious diseases, Williams found in the history of 267 cancer patients among women, 4.8 per cent variola, 6 per cent typhus, 8.9 per cent rheumatic fever, and 1.1 per cent pneumonia; in 83 women with non-cancerous neoplasms, 1.2 per cent variola, 6 per cent typhus, 8.4 per cent rheumatic fever, 2 per cent inflammation of the lungs. Active tuberculosis he saw only twice in 136 sections from carcinoma patients. Kelynack also found only 2 cases among 145 similar autopsies. Obsolete tuberculosis is more often found with carcinoma than with most other diseases,— 12.5 per cent; while Heitler, among 16,562 sections of persons who died of various diseases, found in 4.7 per cent a tuberculosis which had been checked. Carcinoma often, though usually after a long time, follows healed tuberculosis of the lungs; consumption is by far the disease most commonly related to cancer, the disease occurring most frequently in the surviving members of tuberculous families.

Laveran's New Stain for Malarial Blood.— The new staining process used by Laveran is described in full in the *Comptes Rendus* of the Soc. de Biologie, June 9. It is extremely delicate, simple, easy, and reliable, and stains the nuclei deep violet; reds are pink; the protoplasm of the parasites is a pale blue, the chromatin violet-red. He has been successful with preparations of dried blood several years old. Three fluids are required: No. 1 is silver oxide methylene blue, or "Borrel blue." This is prepared in a flask of 150 c.c. of distilled water. When the crystals are dissolved, the flask is filled with a solution of soda and shaken. A black precipitate of silver oxide is deposited, which is washed to free it from traces of azotate and soda. An aqueous saturated solution of medicinal methylene blue is then poured over it and left for seven or eight days, shaking from time to time. No. 2 is an aqueous solution of eosin at one per thousand, and No. 3, a five-per-cent solution of tannin. A bit of camphor in each vial will prevent mold. The specimen of blood dried in a thin layer is fixed with absolute alcohol for about twenty minutes. The stain is mixed just before using, in the proportion of 4 c.c. of the solution of eosin, 6 c.c. of distilled water, and 1 c.c. of "Borrel blue." The fluids are filtered separately as they are poured into the graduated test tube, stirred, and then transferred to a porcelain crucible. The slip holding the blood is placed on top of the fluids, so that the blood rests in the fluid as the slip floats. Five to ten minutes is sufficient to stain the chromatin of most hematozoa, especially of malaria, but several hours are necessary for the endoglobular parasite of birds. When the stain is deep enough, the preparation is rinsed, and treated with the solution of tannin for a minute, then rinsed again and dried. If the stain is too intense, wash with alcohol before mounting in the balsam.—*Jour. Am. Med. Asso., Aug. 11, 1900.*

The Rarity of Caries in the Teeth of Hindus.— The *British Medical Journal* for August 4, commenting on a paper by Dr. Egbert, in the *British Journal of Dental Science*, says that the Indian people are remarkably exempt from caries, and do not often lose their teeth from this cause. There can be little doubt that the immunity is largely due to the fact that careful and regular cleaning of the teeth is a universal habit in India.

It is strictly observed, because it is laid down as an important part of religious ritual. Very exact rules for its performance are given in the great book of Brahmin ritual, called *Nitia-Karma*. To clean his teeth, the Hindu uses a small twig, one end of which he softens out into the form of a painter's brush. Squatting on his heels, and always facing either east or north, he scrubs all his teeth with this brush, after which he rinses his mouth with fresh water. There is, indeed, much in the personal habits of the Indian races which might with advantage be imitated by Western peoples. All Hindus, for instance, strictly observe the custom of washing with water after answering a call of nature, and the European habit of using paper is looked upon by them as an utter abomination, of which they never speak except with horror. They object just as strongly, also, to our use of a handkerchief which is afterward put in the pocket. The general neglect of the teeth in this country is certainly deplorable. Even among the richer classes it is quite uncommon to meet with people who make a regular practice of cleaning the teeth after each meal,— a most desirable habit on hygienic grounds,— and large numbers of the lower orders never use a toothbrush at all. The vegetable nature of the Hindu's food probably has its influence in rendering him less prone to caries than the meat eater, but there can be no doubt that he owes immunity from much pain and ill health to the salutary habit which his religion has wisely enjoined.—*New York Medical Journal.*

Uric Acid and Its Elimination.— In the *Medical Brief*, February, 1900, this vital subject is ably considered. Investigation strengthens the belief that eating too much meat is responsible for the formation of uric acid in disease-producing quantities. To dispose of meat satisfactorily, gastric digestion must be active, the constitution well supplied with fluids, and the organs more or less actively engaged in growth and development. These conditions cease to exist when adult life is reached and the requirements of the constitution are chiefly for food to supply energy, heat, and vital stimulus. At this period in life a small amount of meat or other albuminous food will suffice, especially in torpid systems or persons of sedentary habits. The symptoms caused by an excess of uric acid depend upon the degree of saturation and whether these morbid products are circulating in the blood or are precipitated in the tissues or joints. The susceptibility of the various organs and the constitution of the individual also help to determine the symptoms; one person may have asthma, another an irritable bladder, and another sick-headache or rheumatism. In the treatment, diet is highly important. The writer recommends the liberal use of fresh fruit, especially apples. Tomatoes are also good. Baked bananas and well-browned rice are excellent substitutes for meat.

A New Stain for Neuroglia Fibers. — Yamagiwa (*Virchow's Archiv.*, 1900, CLX, 358) gives the following method, based on Stroebe's stain for axis cylinders: —

1. Harden very thin pieces of fresh tissue in Müller's fluid for about one month, changing the solution daily during the first week.
2. Transfer directly to absolute alcohol for several days to a week.
3. Imbed in celloidin.
4. Stain the sections in a saturated alcoholic solution of eosin for twelve hours or longer.
5. Transfer to a concentrated aqueous solution of aniline blue for four to six hours.
6. Differentiate in dilute alcohol, made slightly alkaline by the addition of a few drops of a one-per-cent solution of caustic potash. (The deep-blue sections become at once or gradually reddish brown, according to the alkalinity of the alcohol.)
7. Wash out the alkaline alcohol in water.
8. Remove the excess of aniline blue in dilute alcohol. (The sections show a reddish color.)
9. Dehydrate in absolute alcohol.
10. Clear in oleum origani cretici.
11. Xylol balsam.

The axis cylinders stain deep blue, the neuroglia fibers and the red blood globules dark red, myelin sheaths light red, the protoplasm of neuroglia cells pale violet or bluish red, the cell body of the ganglion cells pale bluish-gray, connect-

ive tissue fibers, adventitia, and the intima of blood vessels sky blue to pale green, the nuclear membrane of all cells blue, the nucleoli deep violet to deep blue.

The method succeeds only with fresh tissue cut into very thin slices and properly hardened. Tissue left in alcohol too long refuses to hold the eosin stain.

Yamagiwa concludes from the study of his sections that the neuroglia cells in the developed nervous system offer points of support for the neuroglia fibers which are nothing else than the differentiated, peripheral parts of the neuroglia cells whose cell body is not sharply circumscribed by a special membrane; in other words, the neuroglia fibers represent a differentiated intercellular substance, which, however, is not entirely or not everywhere separated from the cells.— *Am. Jour. of the Medical Sciences, September, 1900.*

The Treatment of Gonorrhea.— Casper (*Berliner klinische Wochenschrift*, No. 22, 1900) advises against all abortive treatment, as not accomplishing the desired object, but favoring the occurrence of complications. The symptoms of the disease do not appear until some days after the gonococci have penetrated the mucous membrane of the urethra. The introduction of instruments into the urethra during the acute stage, so long as a florid, purulent discharge is still taking place, is contraindicated, as are also injections that induce irritation of the urethra or aggravate existing inflammation. Some cases of acute gonorrhea set in with marked inflammatory manifestations, while others are wholly unattended therewith. The latter occur especially in patients who have previously had gonorrhea. In both groups, injections may be begun on the first day, but in the first no remedy should be employed that causes irritation or aggravates the inflammatory process, such as preparations of silver. Under these circumstances, potassium permanganate may be employed in dilutions of from 1:10,000 to 1:8,000. In the less acute stage, injections of antiseptic silver salts are useful, and of these the nitrate is the best. This may be employed first in a concentration of 1:10,000, gradually increased to a strength of 1:4,000. Both of these are irritating, and should therefore never be employed alone, but always in association with astringent, secretion-reducing, and antiphlogistic agents. Thus, a combination of silver nitrate with potassium permanganate is injected first; then silver nitrate and zinc sulphate are subsequently employed; and finally potassium permanganate and zinc sulphate in the last stage. The more frequently the injections are made, the better. Attempts have been made to destroy the gonococci and control the secretions by means of a single preparation,— zinc permanganate,— but this has not proved so successful as the combination of zinc sulphate with potassium permanganate.— *Medical Record, July 21, 1900.*

Increased Mortality from Cancer.— The mortality from cancer, according to the combined statistics of England and Wales and also of Scotland, is increasing every year. The increase is more marked in men than in women. The principal number of deaths lie between the thirty-fifth and sixty-fifth years; compared to the number of inhabitants, the number increases from decade to decade. The total amount of increase in the mortality from cancer from 1851 to 1860, and from 1881 to 1890, is 86 per cent for all ages, and over 100 per cent for over fifty-five years. In contrast to this, phthisis as a cause of death has decreased in England and Wales, especially in women more than in men. The maximum mortality of consumption lies between the twenty-fifth and thirty-fifth years; the second highest point of the curve between the thirty-fifth and forty-fifth years, and in this decade falls, also, the highest mortality, if reckoned with reference to the sum total of the inhabitants. In 1876 there were 636 deaths from cancer; from phthisis in 1876, 1,000; in 1897 these estimations were 929 and 1,162.

In this increase of deaths from cancer, carcinoma of the digestive organs predominates; the number of cases of cancer of the generative organs increase less rapidly.

The reason for this marked increase in the mortality from carcinoma is still unknown. Heredity may be a factor. The number of those above the forty-fifth year has not increased. The diminished mortality of consumption could be accounted

for in England, but not in Scotland and Ireland. How far health and nutrition come into play is also uncertain. A review of the mortality of cancer of various vocations indicates that the use of alcohol may be a factor.

Williams, who supports the observations that increased meat eating, with lack of bodily exercise, is a factor in the increase of the cancer mortality, as proof of his argument calls attention to the scarcity of deaths from carcinoma in prisons, where but little animal food is given, and where the prisoners work hard. In 1897 and 1898, out of 5,915 convicts of all ages over twenty years, only three died of cancer; none of the 368 women prisoners died. This is in the proportion of 1: 1,971; opposed to this, the carcinoma mortality of the total population of all persons above twenty years of age amounted to 1 among 698.

The Value of Gelatin as a Hemostatic.— Dr. E. Gaglio (*Riforma Medica*, July 25 and 26, 1900), after a series of experiments upon animals, draws the following conclusions: (1) Gelatin, when mixed directly with blood outside of the organism, slightly favors coagulation, and gives rise to the formation of soft coagula, not firm and contractile like those of normal blood or of blood treated with real hemostatics. (2) Gelatin may be injected into the blood vessels in very large doses without producing coagula within the vessels. It disappears slowly from the blood. The blood which is obtained after these injections coagulates a little more rapidly than normal blood; the coagula are soft, and not firm and contractile. (3) Gelatin injected subcutaneously or into the peritoneal cavity is absorbed very slowly, possibly only by the lymphatics. This absorbed gelatin does not increase the coagulability of the blood. At the point of injection there appears an abundant infiltration of leucocytes attracted by the positive chemotactic property of the gelatin.— *N. Y. Medical Journal, Aug. 25, 1900.*

Amebic Dysentery.— Diamond (*Medical News*, April 7) describes several cases of this condition discovered in Chicago, but contracted in the South. He thinks that this illustrates the frequency with which this affection is overlooked in that region. Early diagnosis is of great importance, and microscopic examination of stools is usually necessary. These should be stained in the fresh state, as recommended by Harris; *viz.*, by a .5 per cent aqueous solution of toluidin blue by passing the staining solution under a cover-glass through a pipet. By this the amebas stand out prominently. The stools should be collected in a clean vessel and not mixed with urine, which kills the organism. In his opinion the best treatment is rectal injection of a solution of hydrogen dioxide and potassium permanganate. Of the former, a twenty-five-per-cent solution may be used, and of the latter fifteen grains to a quart of warm water, two or three times a day, and gradually reduced, according to results. Guarded prognosis must be given, however, as relapses are frequent, and the patient should not be considered out of danger for at least two months after apparent recovery, and during that period should remain on a liquid diet.— *Journal of the Am. Med. Asso., April 21, 1900.*

The Mass and Oxygen Capacity of the Blood in Man.— John Haldane, M. D., F. R. S., and J. Lorrain Smith, M.D., (*Journal of Physiology*, Vol. XXV, No. 5), from experiments conducted by them in the Pathological Laboratory, Queen's College, Belfast, arrive at the following conclusions:—

"1. The mass of the blood in man is about 4.9% ($\frac{1}{20.5}$) of the body weight, and varied, in the fourteen persons examined, between 3.34% ($\frac{1}{30}$) and 6.27% ($\frac{1}{16}$).

"2. The total oxygen capacity of the blood in liters is about 0.85% of the body weight in kilograms, and varied between 0.57% and 0.95%. The total oxygen capacity is, relatively to body weight, more constant than the mass of the blood.

"3. The percentage oxygen capacity of the blood is about 18.5%, and varied between 16.0% and 20.9%.

"4. The oxygen capacity of blood, even from different animals, varies in direct proportion to its coloring power, and may be accurately determined colorimetrically by reference to blood of known oxygen capacity."

Treatment of Ringworm of the Scalp.— Dr. W. Allan Jamieson (Edinburgh *Medical Journal*, June, 1900) in the treatment of ringworm of the scalp recommends the following: (1) That the affected scalp be kept bare of hair until the microscope shows freedom from the trichophyton; (2) that it be washed twice daily with fluid superfatted potash soap and warm water, the soap being poured on a piece of wet flannel, and moderate friction employed; (3) the use of the following modification of an old formula of Sir William Jenner: Precipitated sulphur, 1 dram; salicylic acid, beta-naphthol, ammoniated mercury, of each 10 grains; lanoline or vasogen, 1 ounce. This must be rubbed in for ten minutes slowly and carefully twice a day. The steady saturation of the permeable epidermis with substances hostile to the fungus is the point aimed at.

Epithelioma Treated by Means of Sunlight.— Bie (*Dermatologische Zeitschrift*, August, 1900) reports sixteen cases of epithelioma treated with the chemical rays at Finsen's Institute, seven of which have been completely cured. One was apparently cured, but had a recurrence. Five were improved, but not cured, and in three cases the treatment failed to produce results of any kind. One case which was cured, has been under observation for two and a half years, without any signs of recurrence; the other cases, from six to ten months. This method of treatment is successful only when the growth is superficial and accessible. —*Journal of the American Medical Association, Sept. 1, 1900.*

Treatment of Catarrhal Conjunctivitis.—Milton P. Creel, M. D., in an article on this subject in the *Medical Summary*, urges the importance of paying careful attention to the treatment of this condition. Treatment should be instituted as early as possible in the disease, otherwise a serious termination may result. In the treatment of a large number of these cases, the author follows what he terms an antiseptic line of treatment, from which he obtains gratifying results. The eyes are first bathed with a mixture of one dram of hydrozone in sufficient water to make four ounces. This is used three or four times daily, as the case may demand. After a copious application of this mixture and after the eyelids are dried, he applies two drops of Marchand's Eye Balsam. By this treatment, patients recover in from thirty-six hours to three days.

Bacteriology of the Upper Portions of the Alimentary Canal.— Cushing and Livergood ("Welch's Festschrift"), from observations on thirty-three dogs and fourteen persons, summarize their observations as follows: The bacterial flora is more scanty in the upper part of the intestinal canal than in the lower part. "No definite varieties of micro-organisms seem to be constant elements of this flora, which is apparently dependent upon the bacterial features of the ingesta for its characteristics."

"Some pathogenic varieties, especially streptococci, most readily escape the antiseptic properties of the gastric juice, which is, at its best, limited in its germicidal action.

"At the terminal stages of digestion, and especially after a fast, it is difficult to recover micro-organisms from the mucous membrane of the stomach, duodenum, and even the jejunum as far down as complete emptying of the canal has occurred.

"It is of importance, therefore, by sterilization to rid the food of micro-organisms, especially of such forms of streptococci, preliminary to operative procedures, and also to insure a condition of emptiness of the upper part of the digestive tract.

"As peritonitis following intestinal wounds, operative or accidental, is dependent for its characteristics upon the bacterial flora of the canal at the site of the lesion, the progress of such lesion will be favorable proportionately to the scarcity and innocuousness of the micro-organisms which are present."

Orange Juice in Scorbutic Joint Symptoms.— Butler (Brooklyn *Medical Journal*, June, 1900) calls attention to a case of scurvy, at first mistaken, from its articular manifestations, for acute rheumatism, but diagnosed by an ecchymotic eruption and the failure of salicylates to relieve, in which the administration of orange juice caused a rapid disappearance of the joint symptoms.

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

MORBID CONDITIONS CAUSED BY BACILLUS AEROGENES CAPSULATUS.

WILLIAM H. WELCH, in the Shattuck Lecture for 1900 (Boston *Medical and Surgical Journal*, July 26, 1900), reviews the history of the gas bacillus and recalls its diagnostic characteristics. It is distinguished from the colon bacillus by its power of producing gas abundantly in the blood, organs, and tissues of rabbits killed a few minutes after intravenous injection. Among the points distinguishing it from the bacillus of malignant edema are the following: The malignant edema bacillus is somewhat thinner, has greater tendency to grow into filaments, is less readily stained by Gram, produces spores regularly in culture media, is motile, liquefies gelatin more rapidly, produces a foul odor, produces less gas in lactose bouillon, peptonizes clotted casein, generates little or no gas in rabbits inoculated intravenously and then killed, and by subcutaneous inoculation in susceptible animals causes spreading bloody edema with little or no development of gas bubbles, and appears after death in filaments on serous surfaces. The gas bacillus is widely distributed in nature, the natural habitat being the intestinal canal and the soil. It has been found repeatedly in Europe and America, and by Flexner also in Manila. The gas bacillus has been found in numerous conditions in human beings. Its presence in ordinary cadaveric decomposition is readily explicable by the occurrence of the organism in the healthy intestinal canal. Of a different nature, however, are the cases in which gas bubbles are found in the blood and organs within from one to eight hours after death and without any trace of putrefaction. There is every gradation from cases with a few bubbles of gas in the blood or tissues to those with extensive emphysema of the organs and tissues (Schaumorgane). The author has never found these gas bubbles unassociated with gas bacilli. The invasion in the majority of cases is from the intestine, but whether it and the development of gas occur ante-mortem or post-mortem has not yet been determined with certainty. The finding of gas bubbles within an hour after death offers no conclusive argument against the post-mortem invasion of the organism, and in the great majority of instances there is no doubt that the formation of gas bubbles is a post-mortem phenomenon. The bacillus is of interest to surgeons as well as physicians, since it is a frequent cause of that most dreaded of wound complications, emphysematous gangrene. It is probably not the sole cause, however, and the writer is of the opinion that an aerobic bacillus, probably identical with Sanfelice's bacillus pseudo-edematis maligni, is also capable of producing this affection. Among the uterine infections by the gas bacillus are mentioned emphysema of the fetus, physometra, emphysema of the uterine wall, and puerperal gas sepsis. The bacillus has been found also in cases of puerperal endometritis in which there was no gas in the fetus or the uterine cavity or wall. The urinary tract may not only be a portal of entrance for the gas bacillus into the circulation or adjacent tissues, but also be itself the seat of infection by this organism. In cases of pneumaturia the gas bacillus has been found in the bladder post-mortem, and it has also been encountered in gas cysts in the renal pelvis and in gas blebs under the vesical mucous membrane. These submucous and subserous gas cysts or blebs are among the most interesting of the lesions produced by bacillus aerogenes capsulatus; they have been found by Welch in the stomach, intestine, gall bladder and bile ducts, urinary bladder, renal pelvis, and vagina. The intestine is by far the most common source of the gas bacilli found together with gas bubbles in the blood and organs at autopsies. This invasion may occur either with or without definite intestinal lesions, and is probably in the majority of cases an agonal or post-mortem event. Especially demonstrative of invasion of gas bacilli from the intestine, usually post-mortem, is the occurrence of gas bubbles limited to the neighborhood of the intestine; as, in the intestinal wall, within the portal or mesenteric veins or lymphatics, in the subperitoneal tissue, mesentery, and omenta, around the pancreas, in the mesenteric glands, and

especially in the loose tissue near the gall bladder and in the porta of the liver, without gas in more remote situations. Examples of each of these occurrences have been observed in very early autopsies without ordinary cadaveric decomposition. Among the infections in this class are local gastroenteric lesions, pneumoperitonitis with and without perforation, and hepatic and biliary invasions. Pulmonary, pleural, and cerebral infections have also been observed, and the gas bacillus has been found in the blood during life.— *Medical Record, Aug. 4, 1900.*

Dissemination of Bacteria from the Mouth during Speaking, Coughing, and Otherwise.— The investigations of Flügge and his pupils and of others have shown that in speaking and coughing, droplets of mucus and saliva are expelled from the mouth and carried for some distance away from their source of origin. Such droplets have been found to carry bacteria with them. It is especially in connection with the dissemination of tubercle bacilli that this demonstration becomes of significance. Recently Koeniger has published the results of extensive studies of bacterial dissemination by droplets from the mouth, using the bacillus prodigiosus in his tests because of its ready recognizability from the red pigmentation of its colonies. Persons would rinse their mouths and throats with suspensions of this bacillus, and then, stepping into a specially arranged room, speak in more or less loud tones for varying periods, the disseminated bacilli falling on plates of culture-media disposed here and there throughout the room. In this way coughing, whistling, and sneezing were studied, as well as the special effects of repeating the various letters of the alphabet. Consonants — some more than others — were found to throw out bacteria in greater numbers than vowels. Koeniger establishes the fact that this mode of bacterial dissemination takes place over a much wider range of distance than claimed heretofore, the minute droplets or bubbles sailing far and wide through the atmosphere and alighting on all sides of the experimenters. The greatest distance to which bacteria were carried in these experiments was 12.40 meters.

The question now is: Of what importance is droplet dissemination in the spread of infectious diseases? It would seem, as Koeniger states, that this depends largely on the number of pathogenic bacteria in the mouth. There can be no doubt that persons with pathogenic bacteria in their oropharyngeal cavities may become dangerous to their surroundings. We know that pneumococci and tubercle bacilli frequently occur in the secretions of the mouth; and diphtheria bacilli have been found in all parts of the mouth, not only during the active stages of the disease, but long after convalescence has set in (Neisser). Shaffer and others have demonstrated that lepers with lesions of the oral and nasal mucous membranes give off lepra bacilli in enormous numbers. Influenza, the pneumonic form of bubonic pest, whooping cough, staphylococcus and streptococcus anginas, and infections of the respiratory tract in general are other examples in which dissemination of germs may take place. When the fluids of the mouth are densely populated with bacteria, a coughing spell, "yes, even a few sharp words," would suffice so to contaminate the atmosphere of a medium-sized room that other persons would have a good chance to become infected.

As the possibility of this mode of spreading infectious diseases is so evident, there are certain prophylactic measures that merit enforcement. The handkerchief should be held in front of the mouth when coughing, and this should be generally encouraged for use by the well as much as the sick. In cases of tuberculosis and of plague, a gauze mask for the mouth and nose has been recommended for the patient and also for the attendants. Disinfectant mouth-washes should be used, perhaps not always so much in the interests of the patient as for the welfare of those about him. Then steps should be taken to protect articles in the rooms exposed to infection by this method, which undoubtedly plays some rôle in wound infections. Sneezing disseminates microbes in the well as much as in many sick, and here the conscientious use of the handkerchief is especially indicated. Nurses and hospital attendants, by following the indications pointed out, may do much to protect themselves and others. As mentioned by Koeniger, the playing

of a stream of water on an infected surface of the skin, for instance, is hardly a safe procedure in view of the foregoing statements.— *Editorial, Jour. Am. Med. Asso., June 23, 1900.*

Influence of Cold on Typhoid Bacilli.— Prudden (*Journal of Boston Soc. of Med. Sc.*, April) has shown that water in freezing becomes partially purified, and more recently Sedgwick pointed out that this purification excludes nearly 90 per cent of the bacilli. Prudden found in one week that 80 per cent of the typhoid bacilli were killed in frozen water; in ten weeks, 9 per cent; and in fifteen weeks, 99.9 per cent. About 99 per cent were killed in two weeks with repeated freezing and thawing. Park has repeated Prudden and Sedgwick's experiments, and found that in one half of a week, 42 per cent were left; in one week, 14 per cent; in two weeks, 7.5 per cent; in three weeks, .4 per cent; in five weeks, .11 per cent; and in twelve weeks, only .05 per cent. He has not as yet carried his experiments beyond twelve weeks, and can not say when all living bacilli would cease to exist in the specimens of ice from the most resisting cultures. In twelve weeks the bacilli in the ice from nine sources were all dead. No one of the twenty cultures made were more resistant than Prudden's test culture. When typhoid bacilli are in feces, freezing does not have so much effect. Thus typhoid and colon bacilli, originally 37,000 to a loopful of feces, were still 12,000 at the end of five weeks' exposure to a temperature ranging daily between zero and 28° F. Fecal material from typhoid patients that is thrown out without disinfection in winter and frozen, might easily stay infected until spring and the bacilli be carried a considerable distance after thawing. It is a difficult matter to say how long ice from infected water remains dangerous, and Park thinks we should discourage its use from possible infected waters unless it has been frozen for at least five months. After midsummer, he thinks we could rule out ice infection almost absolutely. He made an experiment to see the effect of low temperatures, which he thinks has been somewhat exaggerated. Ten tubes containing ten specimens of ice infected with typhoid bacilli from different sources, after being frozen two weeks, were put in an ice box at 52° F. for two weeks, and ten duplicate tubes were left at 10° to 20°. There were less left living at the end of seven weeks of those at 52° than of those left frozen at 10° to 20°. Again, typhoid bacilli placed in liquid air for three hours showed a large percentage still living. At a temperature of 70° F. typhoid bacilli in filtered water frequently held their own or increased for a few days, and, at the end of five weeks, two out of ten cultures still contained fifty per cent of their number. He was not able to confirm Prudden's experiments showing that dry cold is less injurious than moist cold.—*Jour. of the Am. Med. Asso., June 9, 1900.*

A New Method of Cultivating the Tubercle Bacillus. — Dr. W. Hesse (*Zeit. f. Hyg. u. Infec.* XXXI; Ref., *American Jour. Med. Sc.*) has conducted experiments with plain agar-agar containing "Nährstoff Heyden" in place of peptone. He demonstrated a growth of the tubercle bacillus within a period of five to six hours. In cultures from tuberculous sputa the growth is sufficient for the demonstration of the tubercle bacilli in smears before the growth of other bacteria has masked the conditions. The growth of this short period is shown by the fact that the bacilli in smears from the culture have twice the dimensions of those in smears from the sputum.

He recommends the following technique: Pour 20 c.c. of the medium into a Petri dish, capacity 9.5 cm. in diameter. After coagulation invert the dish, keeping it in this position in the subsequent manipulations. The sputum should be collected in a sterile glass dish. With a platinum-wire loop pick up a drop of the purulent mucus, and rub it in a circle over the surface of the medium near the border of the dish. From this circle distribute 20 to 30 flakes of the mucus over the surface of the medium. Place the culture in the thermostat for 12 to 24 hours. Sterilize a cover-glass in the flame of a Bunsen burner, and place it over the mouth of a reagent bottle. Remove the cover of the Petri dish, and bring one of the flakes of mucus in contact with the cover-glass. Remove the latter by introducing a platinum-wire loop under one edge, tipping the dish toward the edge. The cover-glass will

then remain hanging by the opposite edge, and may be removed with forceps. If the flake of mucus does not attach itself to the cover-glass, touch the latter with a hot platinum-wire loop at the point, where it is in contact with the mucus, in order to melt the medium slightly. Cultures should be kept in a moist chamber.

He gives the composition of the medium as follows:—

"Nährstoff Heyden".....	5	grms.
Salt.....	5	"
Glycerin.....	30	"
Agar-agar.....	10	"
Normal sod. hydrate sol.....	5	c.c.
Distilled water.....	1,000	"

The "Nährstoff Heyden" should be dissolved in a little water. After the other ingredients have boiled for about two hours, it should be added, and the boiling continued fifteen minutes longer. Filter.— *The Post-Graduate, July, 1900.*

Bacillus Icteroides the Cause of Yellow Fever.— Geddings and Wasdin, in their report of investigations made by them concerning the cause of yellow fever, arrive at the following conclusions: —

1. The micro-organism discovered by Prof. Giuseppe Sanarelli, of the University of Bologna, Italy, and by him named "bacillus icteroides," is the cause of yellow fever.

2. Yellow fever is naturally infectious to certain animals, the degree varying with species; in some of the rodents local infection is very quickly followed by blood infection, and while in dogs and rabbits there is no evidence of this subsequent invasion of the blood, monkeys react to the infection the same as man.

3. Infection takes place by way of the respiratory tract, the primary colonization in this tract giving rise to the earlier manifestations of the disease.

4. In many cases of the disease, probably a majority, the infection or colonization in the lungs is followed by a "secondary infection," or a secondary colonization of this organism in the blood of the patient. This secondary infection may be complicated by the coinstantaneous passage of other organisms into the blood, or this complication may arise during the last hours of life.

5. There is no evidence to support the theory advanced by Professor Sanarelli that this disease is primarily a septicemia, inasmuch as cases do occur in which the bacillus icteroides can not be found in the blood or in the organs in which it might be deposited therefrom.

6. There exists no causal relationship between the bacillus "X" of Sternberg and this highly infectious disease, and this bacillus "X" is found frequently in the intestinal contents of normal animals and of man, as well as in the urine and the bronchial secretion.

7. So far as your commission is aware, the bacillus icteroides has never been found in any body other than of one infected with yellow fever, and whatever may be the cultural similarities between this and other micro-organisms, it is characterized by a specificity which is distinctive.

8. The bacillus icteroides is very susceptible to the influences injurious to bacterial life, and its ready control by the processes of disinfection, chemical and mechanical, is assured.

9. The bacillus icteroides produced in vitro, as well as in vita, a toxin of the most marked potency, and from our present knowledge, there exists a reasonable possibility of the ultimate production of an antiserum more potent than that of Professor Sanarelli's.

Bacteriology of Measles.— Lesage studied two hundred cases of measles, and inoculated rabbits with nasal mucus or blood from a large number. The results were positive in nearly every case, and Lesage considers himself justified in announcing that the delicate micrococcus he found so constantly, probably had something to do with the etiology. As far as it is possible to recognize measles on a hairy animal, he thinks his inoculations induced the disease. The micrococcus cultivates best on gelose; decolors with Gram; takes stains slowly. The cultures resemble those of the pneumococcus. It was not found in twenty-five cases of scarlet fever, but constantly in six cases complicated with measles, also in two cases of measles complicating diphtheria; it was never found in forty-five normal children, and only twice in fifty-three children who had had the disease previously.— *Jour. Am. Med. Asso., April 21.*

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BATTLE CREEK, MICH., SEPTEMBER, 1900.

TREATMENT OF THE VOMITING OF PREGNANCY.

THE Indiana *Medical Journal* publishes the following as a summary of the best known means of treating the vomiting of pregnancy: —

"1. Rest in bed.

"2. Coffee in morning, fasting, two hours before rising.

"3. Liquid food, especially milk and lime water (equal parts), beef juice, egg albumin and tincture opii, and hydrochloric acid, diluted.

"4. Drugs; orexin tannate the best. Commence with four grains once daily, then twice daily, and increase to five grains three times a day; cocain, four-per-cent solution, ten minims every three hours — give only four doses; ingluvin, twenty-grain doses, sixth hour. Drop doses of vin. ipecac. or Fowler's solution.

"5. Lavage of stomach.

"6. Rectal alimentation.

"7. Dilating cervix useful, painting as with cocain, ten-per-cent, to ease the pain of dilatation.

"8. If drugs fail, washing out the stomach and rectal feeding the best.

"9. If all these methods fail, and the patient is losing strength rapidly, upon consultation, empty the uterus."

Some of the foregoing measures are excellent, but others, in the writer's opinion, are doubtful, particularly the use of coffee and beef juice. In the writer's experience, but little benefit is derived in these cases from the use of drugs, and temporary relief is likely to be followed by increased inconvenience later, for the direct cause of the nausea and vomiting, *i. e.*, an abnormally irritable condition of the abdominal sympathetic, is only very transiently influenced by the remedies mentioned, while the resistance of the system is in many cases diminished.

Two remedies which the writer finds of very great value in these cases are the following: —

1. The administration of a little dry food about half an hour before rising, as zwieback, or twice-toasted bread, chewed very thoroughly, and followed, if the patient desires, by a little fruit, is to be highly recommended.

2. Hydrotherapy is of incalculable benefit. One of the most valuable of the many hydriatic measures which may be employed, is the hot and cold trunk pack, which is administered as follows: —

The moist bandage is placed around the trunk, at the level of the umbilicus, in the usual manner for the *umschlag*, or wet girdle, which consists of a linen bandage of sufficient width to cover the desired part, and about three yards in length, or sufficiently long to pass three times around the body; a flannel bandage three or four inches wider than the linen one; and a waterproof covering of oiled silk or other impervious material. A rubber or aluminum coil is placed upon the wet bandage, over the epigastrium. The blankets are then tucked snugly about the patient, and a stream of hot water is kept flowing through the coil continuously during the application, at a temperature as high as the patient can bear.

This hydriatic method was first described by Prof. W. Winternitz, of Vienna, who employed it in a case of persistent vomiting due to chronic gastric

disorder. It occurred to the writer to adopt the same measure for the relief of the vomiting of pregnancy, and he has found it uniformly successful in a considerable number of cases in which it has been used.

The hot and cold trunk pack should be applied fifteen or twenty minutes before the patient is allowed to eat, and should remain in place from one to two hours. It should be employed in connection with each meal. It is better that the patient eat but twice daily, unless the quantity taken at a single meal is too small to maintain nutrition.

In connection with the hot and cold trunk pack, cold friction, the cold towel rub, or in extremely feeble patients the cold wet-hand rub may be very usefully employed. A description of cold mitten friction is given elsewhere in this number. The neutral bath may also be usefully employed as a means of lessening the irritability of the general nervous system. This bath consists of a full bath at 92° to 95°. At the beginning, the temperature may be 98°. The duration of the bath should be fifteen minutes to half an hour, or even longer. The patient should be rubbed gently every two or three minutes, to prevent chilliness. At bedtime is the best time for the administration of the full neutral bath. It produces sound sleep, and encourages diuresis and general metabolism. If more convenient, the sitz bath at the same temperature, 92° to 95°, may be employed instead of the full bath.

PERNICIOUS ANEMIA A CHRONIC INFECTION.

W. HUNTER, in the *Lancet* for Feb. 10, 1900, points out the fact that pernicious anemia is an infectious disease. The nature of the infection is a mixed one, both cocci and streptococci being present in masses mixed with the catarrhal inflammatory products found in the vomit. Great care must be given to the hygiene of the mouth and teeth. The stomach must also be cleansed.

In the treatment of a considerable number of cases of this sort, the writer has observed in many of them marked evidence of gastric infection. In one case six million bacteria were found in a single cubic centimeter of stomach fluid. By an antiseptic diet and vigorous hydriatic treatment, this patient's blood-count was raised in the course of a few weeks from a few hundred thousand to four million, two hundred thousand.

Very pessimistic views are generally taken respecting the future of these cases. It is claimed that they all relapse sooner or later, but in the writer's opinion this is due to the fact that patients return to their old habits. In one case known to the writer, a patient had made an excellent recovery, but on returning to his home relapsed to his tobacco using and his former unwholesome dietary after a year's exemption from the disease. It was but a few weeks until marked symptoms of anemia set in, and soon he was as bad as ever. The assumption of correct habits and an antiseptic dietary again resulted in his restoration to health. The lesson he has learned may enable him to escape another relapse.

An Aseptic Country.— Dr. Levin, of Stockholm, contributes to the *American Journal of the Medical Sciences* for April, 1900, an interesting communication, the results of a careful study of the air of the Arctic region from a bacteriological standpoint. On various occasions the Doctor carefully filtered twenty thousand liters of air, finding practically no bacteria; in other words, the air of the Arctic region was found to be virtually sterile. Examination of snow, ice, and ice water showed the presence of one bacterium to about eleven cubic centimeters, or about thirty-three drams, of the medium. Twelve specimens of brown mud exam-

ined, showed but one bacterium, and the surprising fact was definitely determined that bacteria are rarely found in the intestines or fecal matter of seals, polar bears, sea urchins, crabs, dogs, and various other animals. The intestinal contents were examined both by staining and by culture, specimens of which were nearly always found sterile. These observations are of great value, as thoroughly confirming the conclusions of Nencki and other investigators who several years ago demonstrated by laboratory experiments that the presence of bacteria in the alimentary canal is not essential to healthy digestion and nutrition.

The Carbonic Acid Bath.— The influence of carbon dioxide upon the skin in stimulating the capillary circulation is one of the chief benefits derived from mineral baths in which carbonic acid is held in solution, such as the Nauheim baths. Dr. Rudolf Hatschek has suggested rubbing the body with bicarbonate of soda moistened with a little water.

It occurred to the writer to improve upon this suggestion by the employment of baking powder. The cheapest kinds of baking powder answer the purpose. The application is made in the following manner: Some baking powder is placed in an ordinary pepper box or a toilet-powder box. The attendant moistens the skin and rubs with one hand, while with the other hand the baking powder is sprinkled upon the skin. In this way, carbon dioxide may be developed in any quantity desired, in immediate contact with the skin, which is quickly reddened thereby. If a purely derivative effect is desired, the temperature of the water may be neutral, that is, 92° to 98°, or even warmer. If it is desired to combine a tonic effect with the derivative action, water at a temperature of 60° or lower should be employed. If baking powder is not at hand, a good mixture can be made by combining bicarbonate of soda with tartaric acid in the proportion of eight ounces of bicarbonate of soda to six ounces of tartaric acid; or, a cheaper mixture, consisting of one-half pound of bicarbonate of soda and one pound of sodium bisulphate, may be employed, or ordinary bicarbonate of soda may be used, the surface being moistened with a weak solution of vinegar or a solution of lactic or citric acid.

Hydrotherapy in Disorders of the Menopause.— Gottschalk recommends, from personal observation in a number of cases, hot baths as a means of relieving the sweating and hot flushes and associated disturbances occurring at the menopause or after removal of the uterus or adnexa. The hot baths are administered at bedtime, duration twenty minutes. Three or four weeks' treatment was sufficient to effect a cure. He does not state exactly what temperatures were employed, but baths at 92° to 96° are best for these cases. Carefully graduated tonic treatment, consisting of wet-hand rubbing, cold friction, the friction mitt, cold wet-towel rubbing, and like measures, is of greatest service.

The Temperature of the Human Body.— Observations made by Colonel Hamilton, of the India Medical Staff, upon Gurha soldiers, indicate that the normal temperature of the natives of the Himalayas is 96° to 97°, from which it seems just to conclude that body temperature is influenced by climatic conditions.

Fever and Feverishness.— Patients often complain of fever because the skin is hot and dry, the face flushed, there is fullness in the head, and a general feeling of malaise, feelings which are also present in ordinary fever. Examination with the thermometer, however, shows absence of elevation of temperature.

PRACTICAL URINALYSIS AND URINARY DIAGNOSIS: A Manual for the Use of Physicians, Surgeons, and Students.— By Chas. W. Purdy, LL. D., M. D., Queen's University; Fellow of the Royal College of Physicians and Surgeons, Kingston; Professor of Clinical Medicine at the Chicago Post-Graduate Medical School; author of "Bright's Disease and Allied Affections of the Kidneys," also of "Diabetes: Its Causes, Symptoms, and Treatment." Fifth revised and enlarged edition, with numerous illustrations, including photo-engravings and colored plates. 1900. F. A. Davis Company, publishers, Philadelphia, New York, Chicago.

This (the fifth) edition of this valuable work is in keeping with its predecessors in that it contains all of the latest valuable scientific facts relating to the subjects of which it treats. To those who are familiar with the work, it needs no commendation; to those who have not been so fortunate as to possess a copy, the fact that the work has gone through five editions in as many years should be ample evidence of its value.

The present edition consists of a thorough revision of the last, together with considerable new matter, including a new chapter on the microscope and its use in urinalysis. It also contains much valuable information with reference to centrifugal analysis. This subject has now been placed on a sound scientific basis, which has made it of great practical value. The author treats the subject in a very comprehensive and practical manner. The workmanship of the book is good, and will make a very valuable addition to the physician's or medical student's library. To those interested in this subject we heartily recommend the work.

STUDIES IN THE PSYCHOLOGY OF SEX: The Evolution of Modesty; the Phenomena of Sexual Periodicity; Auto-Erotism.— By Havelock Ellis. 6⅜ x 8⅞ inches. Pages XII-275. Extra cloth, $2.00 net. Sold only to physicians and lawyers. F. A. Davis Company, Publishers, 1914-16 Cherry St., Philadelphia.

The reader of this neat volume is at once struck with the able scientific manner in which the author handles the subjects treated,— "The Evolution of Modesty," "The Phenomena of Sexual Periodicity," and "Auto-Erotism." To those interested in these subjects this work will furnish much valuable information. The workmanship of the book is good.

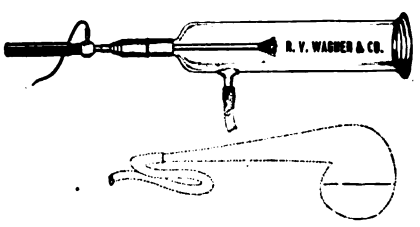
PAMPHLETS RECEIVED.— "Pink Eye." W. Cheatham, M. D., Louisville, Ky.

"Some Points in the Management of Obstetric Cases in Private Practice." Joseph Brown Cooke, M. D., New York.

"Submucous Ligature for Rectal Hemorrhoids and Prolapse." B. Merrill Ricketts, Ph. B., M. D., Cincinnati, O.

PUBLISHERS' DEPARTMENT.

MUCH attention is being given to the use of static electricity as developed by a static machine running at a high rate of speed. For many purposes the current thus developed is of special value, and its latest application for the cataphoresis of gaseous substances, such as volatilized mercury, formaldehyde, oil of cinnamon, etc., has proved to be a most effective means of applying such remedies directly to the diseased tissues, and is an ideal treatment for consumption, tubercular joints and glands, or for any local infection. Dr. R. V. Wagner has lately invented and perfected an instrument which makes the use of static cataphoresis most convenient, and will enable any one having a static machine to avail himself of this new and effective mode of treatment.



The instrument consists of a glass cylinder made to fit closely to the skin at one end, while the other is fitted with an adjustable discharge brush; the brush should be attached to the positive pole, while the patient is in contact with the negative. The discharge of current passing from the brush to the patient through the gases or medicated air (which may be admitted to the cylinder through an opening leading to a retort or other receptacle by rubber tubing), drives the substances in with much greater penetration and in a form more suitable than any other known means of cataphoresis.

The Battle Creek Sanitarium

LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
A. B. OLSEN, M. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR AUGUST.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total
103 per cent.	16	7	23
100 " "	98	79	177
98 " "			
95 " "	24	21	45
93 " "	16	30	46
91 " "			
88 " "	11	10	21
85 " "	17	18	35
83 " "	5	5	10
78 " "	6	6	12
71 " "	4	2	6
Below 70 per cent.	1	3	4
Total	198	181	379

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	50	19	69
Between 4,500,000 and 5,000,000	58	71	129
" 4,000,000 " 4,500,000	42	50	92
" 3,500,000 " 4,000,000	21	25	46
" 3,000,000 " 3,500,000	7	13	20
" 2,500,000 " 3,000,000	13	2	15
Below 2,500,000	7	1	8
Total	198	181	379

Examination of Sputum.— There were 41 examinations made, 30 being new cases. Tubercle bacilli were found in 10 cases.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	42	100	32	100	108	80	182	87
Less than 10,000 bac					5	4	5	2
Between 10,000 and 100,000 bac					3	2	3	2
More than 100,000 bac.					19	14	19	9
Total	42	100	32	100	135	100	209	100

The patients were received from the following States and countries: Illinois, 30; Michigan, 23; Ohio, 23; Kentucky, 19; Iowa, 14; Indiana, 13; Wisconsin, 11; Missouri, 8; Pennsylvania, 8; Tennessee, 6; New York, 5; Minnesota, 5; Alabama, 5; Texas, 4; Louisiana, 4; Florida, 3; Colorado, 3; Kansas, 3; Arkansas, 3; South Dakota, 2; New Jersey, 2; Washington, 1; Utah, 1; Oklahoma, 1; Nebraska, 1; West Virginia, 1; Mississippi, 1; California, 1; Georgia, 1; Massachusetts, 1; Montana, 1; Japan, 1; Switzerland, 1; Canada, 3. Total, 209.

Urinary Laboratory. — Total number of specimens examined, 1,795; number of new cases, 371; number of cases having albumin, 55; sugar, 8; casts, 9; blood, 5; pus, 99.

DR. JOHN B. MURPHY has accepted a professorship in Surgery and Clinical Surgery in the Northwestern University Medical School, Chicago Medical College. Dr. Murphy has been appointed Surgeon-in-Chief of Mercy Hospital, with the direction of the surgical teaching in that Hospital. He will give two clinics each week at the Hospital, which now contains 260 beds, with abundance of clinical material. A new amphitheater, with a seating capacity of three hundred, is in progress of construction.

Dr. Archibald Church has recently been appointed Professor of Nervous and Mental Diseases in Northwestern University Medical School, Chicago Medical College, and head of the Neurological Department.

THE MEDICAL SOCIETY OF THE MISSOURI VALLEY held its annual meeting at Council Bluffs, September 20. Three sessions were required to complete the most interesting program, and later, at the Grand Hotel, the members gathered around the festal board, where they recuperated from the labors of the day.

The Society voted to contribute twenty-five dollars to the Rush Monument Fund, and a resolution was adopted providing for a banquet after each meeting.

The following officers were elected: President, Dr. V. L. Treynor, Council Bluffs; first vice-president, Dr. B. B. Davis, Omaha; second vice-president, Dr. F. E. Sampson, Creston; treasurer, Dr. T. B. Lacey, Council Bluffs; secretary, Dr. Chas. Wood Fassett, St. Joseph. The next meeting will be held in March, 1901, at Omaha.

THE twenty-eighth annual meeting of the American Public Health Association will be held at Indianapolis, Ind., beginning Oct. 22 and continuing until Oct. 27, 1900.

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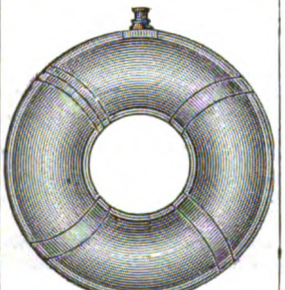

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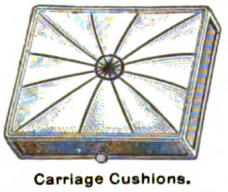

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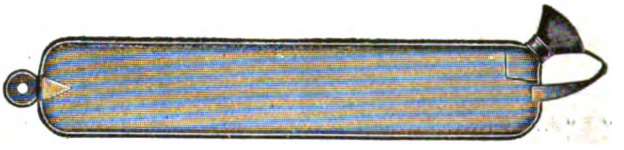

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" " " " 16x16, "	6.50

Invalid Chair Cushions,	Seat.	Back.	
No. 1, sateen cover	16x16	16x16	7.50
No. 2, " "	16x16	16x18	7.75

GOOD HEALTH PUB. CO.,

BATTLE CREEK, MICH.

MODERN MEDICINE

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ORIGINAL ARTICLES.

HYDRIATIC PRESCRIPTION MAKING.

BY J. H. KELLOGG, M. D.,
Superintendent of the Battle Creek (Mich.) Sanitarium.

A CLEAR conception of the nature of disease is the first essential in the building of a hydriatic prescription and in searching for therapeutic indications. To say that disease is disharmony, a morbid state, a perverted vital activity, is merely to say that when a man is sick he is not well. In a condition of health the body is not only in a state of ease and comfort, but possesses the ability to maintain itself in such a state. This faculty which the body possesses of maintaining a physiological equilibrium, of resisting the encroachments of microbes and other enemies, is termed "vital resistance." This most important factor is always to be taken into consideration in formulating a rational prescription.

The diseased body heals itself by precisely the same processes by which it maintains itself in health. Napoleon recognized this fact when once he protested against the polypharmacy of his day, exclaiming, "Life is a fortress. Why throw obstacles in the way of its defense? Its own means are superior to all the apparatus of your laboratories."[1] To say that the thoroughly well man never falls sick, is not a paradox. The morbid manifestations or pathological states which are commonly known as disease, either acute or chronic, result, not only from the recognized immediate or exciting cause, but from a lessening of the natural resistance to disease, or the innate ability to keep well. For example, typhoid fever, as Bouchard has shown, chooses for its victims, persons whose stomachs have lost the power to destroy the typhoid bacillus, which thus finds entrance to the intestines, and finding there a favorable habitat, rapidly grows, and produces the series of morbid processes which constitutes the clinical picture of typhoid fever. Cholera germs, likewise, are unable to develop in the healthy alimentary canal, but obtain a permanent footing in the body only when the stomach has been weakened by indigestion or subacute gastritis. The tubercle bacillus is not able to establish itself in the thoroughly healthy organism, but thrives in the body which is rendered a favorable soil for this parasitic organism by errors in diet, neglect of exercise, and other unhygienic habits.

The rational treatment of disease requires first of all the removal of causes. The second step is to stimulate and regulate the normal physiological activities. This is the essential particular in which rational medicine differs from empiricism and the artificial method, the evils of which were so well pointed out by Dr. Jacob Bigelow, of Boston, half a century ago. When the body is in a disordered state, it is evident that it is far better to restore the physiological equilibrium by removal of the disturbing element or by encouraging those physiological activities which constitute the normal defenses of the body, than simply to antidote or neutralize one disorder or disturbance by creating a counter-disorder, or in other words, as suggested by the famous Baron Liebig, to undertake to cure one disease by producing another. There are, of course, conditions under which such measures may be commendable, but only as a last resort or relief of pressing symptoms which do not yield to other measures, or in cases recognized as incurable, and in which only palliation can be expected.

The Natural Defenses of the Organism.—The natural methods by which the

[1] Emerson's Essays.

body resists disease must be clearly understood. First of all is the blood, of which Holy Writ declares, "The blood is the life." The nerve supply of a part may be destroyed,— a limb, for example, may have lost entirely both sensation and power of motion, yet its life is maintained through the fact that the living blood is still circulating through its vessels. Cut off the blood supply, and even though no other injury be done to the limb, death will speedily occur. The blood is not only the source of life, but is the great healing agent of the body.

In disease, the blood carries oxygen directly to the part in which the life-battle is being fought, whereby the cells engaged in the conflict are stimulated and sustained while the accumulated poisons are burned, or are carried away by the serum with which the tissues are bathed. Through the control of the general blood movement and of the local blood supply, hydrotherapy is capable of influencing almost every morbid process.

One of the most remarkable and useful methods by which the body defends itself against morbid processes is that known as phagocytosis, in which the white corpuscles of the blood destroy or remove from the circulation disease-producing microbes of various sorts which may find entrance.

The destruction of germs is also carried on in the body by other cells than the white corpuscles of the blood. The spleen doubtless possesses the power of attenuating parasitic organisms even though they may not be entirely killed. The lymph glands wage a fierce and often successful battle against the encroachments of microbes of various sorts. It is this fact which gives rise to the rapid enlargement of the lymphatic glands in the vicinity of an infected part. The same enlargement and increase of activity of the glands and other structures usually takes place after removal of the spleen. Various cells lining the nasal cavity and the alimentary canal are able to destroy microbes of many sorts and thus to protect the body from disease.

The destruction of poisons by the liver, by the thyroid gland, the suprarenal capsules, and doubtless by other structures, is a most important and admirable method of automatic defense, which is of the highest value in both health and disease; but in certain forms of disease, especially in acute infectious fevers, it is indispensable to the saving of life.

As pointed out by Charrin, the alkalinity of the blood plays a most important part in the defense of the organism, both in ordinary health and in disease. A lowering of the alkalinity of the blood diminishes the activity of the leucocytes, lessens the energy of the normal reflexes, diminishes the promptness and energy of those manifold reactions upon which so many of the life processes depend. The alkalinity is lowered in various diseases, especially in fever, in rheumatism, gout, diabetes, and in many cases of indigestion. This lessening of the alkalinity is always accompanied by lowered vital resistance. This is well shown in the frequency with which skin diseases, gangrene, cataract, and various other affections due to lowered resistance occur in diabetes. Milch cows are not infrequently subject to diabetes, and when in this condition, suffer more than usual from phlegmon.

The thyroid and perhaps other glands not only destroy poisons, but act as general regulators of nutrition through the internal secretions formed. These secretions produce various physiological effects, as vasodilatation, and stimulation of the spinal cord.

The kidneys aid in the defense by eliminating poisons, especially those resulting from the oxidation of proteids. The suprarenal capsules are active in destroying certain poisons. The liver purifies the blood by removing the alkaline wastes, and forming urea from uric acid and other more highly toxic substances.

The skin plays a very important part in defending the body, not only in acting as a non-conductor and a regulator of the bodily temperature, but by opposing the entrance of germs and by maintaining the various interesting reflex activities whereby the internal machinery of the organism is kept in motion.

General Indications.— The general indications for the employment of hydriatic procedures which are encountered in the management of different acute and chronic maladies may be enumerated as follows:—

Activities To Be Encouraged:—

1. General vital resistance.
   a. Destruction of toxins.
   b. Elimination of toxins.
   c. Destruction and elimination of bacteria.
2. Oxidation.

3. The functions of the automatic and reflex centers.
4. General and local metabolic processes, blood formation, glandular activity, etc.
5. Cardiac activity and general blood movement, and local blood supply.
6. Heat production.
7. Heat elimination.

Activities and conditions to be diminished, combated, or mitigated.

1. Nervous irritability.
2. Bacterial growth.
3. Blood movement and volume.
4. Exaggerated metabolism.
5. Heat production.
6. Heat elimination.

In addition to the above indications, which are drawn chiefly from a study of the etiology and pathology of disease, we may find through a study of the clinical history, course, complications, and termination of various chronic and acute diseases, a great number of special indications for the employment of both palliative and curative measures.

To deal exhaustively with each one of these several indications would require an extensive volume. We will undertake to present in the briefest manner possible only the most useful facts in relation to the use of hydriatic measures in meeting these several important indications.

Procedures for Increasing Vital Resistance.—Vital resistance, as Charrin has suggested, is a property of the individual cells. To increase the vital resistance, the energy and activity of the cell must be increased. Hydrotherapy affords a most excellent means of accomplishing this in the application of cold water to the cutaneous surface. It is generally conceded that the increase of vital resistance is one of the greatest advantages presented by the Brand bath in the treatment of typhoid fever and other infectious diseases. The Brand bath is not applicable, however, to all cases in which it is necessary to increase vital resistance. Fortunately, there are numerous procedures whereby vital resistance may be increased which differ sufficiently in form and intensity to make possible the most complete adaptation of the therapeutic means to the requirements of every case.

There are various partial or mixed procedures of greater or less value as a means of increasing the vital resistance through their exciting or tonic effects, of which the following may be especially mentioned: The wet-sheet pack, the wet girdle, the chest pack, the rubbing sitz, alternate sponging of the spine, the alternate spinal compress, cold water drinking, the small cold enema.

Any of these tonic procedures may be preceded by a short hot application as a preparation for the cold procedure, but the hot application must be very brief, and the cold application must be prolonged sufficiently to produce the dominant effect. It must be remembered, however, that cold is primarily a depressing agent, and hence applications intended to increase the vital resistance must be very brief and must be promptly followed by reaction. The lower the temperature, if the duration is short, the more highly tonic the effect of the application. Nearly every case of chronic disease requires cold applications of some sort twice a day, even if nothing more intense than the cold mitten friction. In cases of fever, cold applications, such as cold mitten friction or cold towel rubbing, should be applied every three or four hours unless a cold bath of some other sort, such as the wet-sheet pack or the Brand bath, has been administered.

The principal ways in which the body resists the encroachments of disease are (*a*) destruction of toxins; (*b*) elimination of toxins; (*c*) destruction and elimination of bacteria.

a. Procedures Which Encourage Destruction of Toxins.—All procedures which encourage vital resistance, at the same time encourage the destruction of toxins by stimulating the toxin-destroying cells of the thyroid gland, the liver, the spleen, the lymphatics, and other tissues. The efficiency of these organs is also increased by the increased rate of blood movement which always follows tonic cold applications. The hepatic douche and the splenic douche increase the activity of the two largest glands in the body, while the general cold douche powerfully stimulates all the bodily activities by which destruction of toxins is promoted.

b. Procedures to Encourage the Elimination of Toxins.—In observations made upon rabbits some seven or eight years ago, the writer demonstrated that the perspiration of the ordinary healthy man contains toxic substances in such quantity that from 100 to 120 c.c. of the liquid collected from the surface of a sweating

man, when injected intravenously, is capable of killing a rabbit weighing one kilogram. It has been shown that in epileptics the toxicity may be enormously increased. In one case of this disease, 20 c.c. of the sweat thrown off during a paroxysm was found to be sufficient to kill a rabbit weighing one kilogram. Bouchard has also shown that certain poisons are thrown off by the skin. Hence eliminative baths, especially the electric-light bath, the sweating wet-sheet pack, and the vapor bath, are valuable means for encouraging the elimination of toxins resulting from bacterial action or perverted metabolic processes. The kidneys, liver, and bowels are the most important outlets for toxic substances. The liver disposes of alkaline wastes, the kidneys remove urea, also uric acid, and other products of deficient oxidation, while a variety of poisons find their way out through the intestines.

c. Water can not be employed in such a way as to act directly as a germicide, but by increasing the alkalinity of the blood and especially by increasing leucocytosis and the activity of the lymphatic glands and other organs capable of destroying bacteria, the encroachments of these enemies of life may be successfully opposed.

The observations of Metchnikoff and others have shown clearly the importance of leucocytosis as a means of combating bacterial infection. By the regulation of the local blood movement and volume, leucocytosis may be encouraged to almost any desired degree. Winternitz, Thayer, Thermes, and numerous others have shown the enormous influence of the general cold bath in producing general leucocytosis. By means of the heating compress frequently renewed, and the alternate compress, local leucocytosis may be encouraged to a marvelous extent, and most admirable results in utilizing the natural defenses of the body may be secured. This fact has been demonstrated in multitudes of cases in the management of pneumonia, typhoid fever, and other maladies in which the pathological process is circumscribed and due to microorganisms.

The most effective procedures for encouraging leucocytosis are the heating compress or pack, the alternate compress, the Scotch douche, and the alternate douche. The elimination of bacteria by the skin and kidneys is encouraged by sweating baths, copious water drinking, and especially by the vapor bath, the sweating pack, and the neutral prolonged bath, each followed by cold mitten friction, the cold towel rub, or some other cold procedure.

Procedures Which Increase Oxidation.— Strasser and others have shown that the application of the cold bath increases the absorption of oxygen and the elimination of CO , and it is evident that general oxidation is thereby increased throughout the body. By the employment of hot baths in such a way as to elevate the body temperature, the oxidation of proteid substances is increased. We are thus in possession of means by which either the oxidation of carbon,— in other words, the burning up of sugar or fat,— or the oxidation of nitrogen, and the more perfect combustion and elimination, through conversion into urea, of uric acid, creatin, creatinin, and other proteid wastes, may be effected at will.

Cold applications for the purpose of increasing oxidation should be general in character, or at least should be sufficiently extensive to lower the body temperature a few tenths of a degree, in order to develop the reaction necessary to increase heat production, and consequently consumption of the carbonaceous elements. More prolonged baths, such as the dripping sheet, rubbing shallow, cold immersion, plunge, and the cooling pack, are the measures most effective for stimulating oxidation of the fat and carbohydrates.

The hot immersion bath, the heating pack, the dry pack, the vapor, hot air, and Turkish baths, sun bath, and especially the electric-light bath, are the most efficient means of stimulating nitrogen oxidation. By means of these measures, the body temperature may be elevated a few tenths of a degree, or even three or four degrees, according to the duration of the bath. These general hot applications should always be followed by a very short general cold application, to counteract the depressing effects of the hot bath, and to restore the tone of the skin.

Procedures Which Excite the Central Ganglia.— In adynamic fevers, in many neurasthenic states, in cardiac failure, hypopepsia, renal insufficiency, and various visceral congestions, general or localized excitation of the central ganglia is

clearly indicated. This may be admirably accomplished by various hydriatic procedures, especially by very cold, very hot, or alternate hot and cold applications. The alternate general douche, percussion or alternate spinal douche, alternate spinal sponging, alternate spinal compresses, alternate immersion, with all the various forms of cold, alternate, and hot and cold localized compresses, are most efficient means of exciting the central ganglia.

Measures Which Encourage General and Local Metabolic Processes.— In most forms of chronic diseases, there is either primarily or secondarily a grave disturbance of the general nutrition, arising from failure of the tissues to maintain normal metabolism. The failure may be either general, as in some forms of autointoxication, or local, as in hypopepsia. In both classes of cases, hydrotherapy furnishes efficient and potent measures which may be relied upon to awaken the sluggish organs to normal activity, provided the integrity of their tissues has not been too extensively damaged. This may be accomplished by the same measures which have been mentioned above as capable of increasing vital resistance and stimulating the central ganglia. Tissues to which applications may be directly made are most quickly excited by hot applications; as, for example, when it is desired to produce cutaneous activity, the results may be most quickly secured by a general hot bath of some sort. The best and most permanent effects are produced, however, by somewhat prolonged hot applications followed by a brief cold application. The most effective means of stimulating visceral activity is by applying to the related skin area a short cold douche with strong pressure, the alternate douche, the alternate or the heating compress. These measures also increase blood formation and glandular activity.

That general cold applications to the cutaneous surface promote to a high degree the processes of blood formation is well shown by the efficiency of the cold bath in combating the most inveterate forms of anemia, even when all other measures have failed. It is certainly safe to say that there is no known remedy of such great value in promoting blood formation as short general cold baths. The lower the temperature, the better, but the application must be very short. The cold mitten friction and the cold towel rub applied two or three times daily are especially valuable for this purpose. For patients who have been trained to its use, the cold douche is the most effective of all.

Procedures Which Increase Blood Movement and Local Blood Supply.— By the regulation of the general movement of the blood, all the nutritive processes of the body may be influenced. Since the blood is the great healing agent of the body, measures whereby the movement of the blood throughout the body may be encouraged or controlled are of the greatest importance in dealing with both acute and chronic diseases of almost every sort. Cold applications to the surface excite the heart, increase the blood pressure, and increase the movement of the blood and lymph throughout the body. All tonic measures may be used for this purpose. The cold precordial compress serves a like purpose, and may be employed in many cases when general cold applications may be inadmissible, and also when hot applications are required for some other purpose, thus antagonizing the depressing effect of heat. Cold mitten friction and the cold towel rub are especially useful in re-enforcing the energy of the heart and encouraging the circulation in almost all cases in which these indications are present, whether in cases of fever, cardiac or renal diseases, or in cases of neurasthenia with general feebleness, and in chronic tuberculosis and other wasting disorders.

General hot applications at first stimulate the heart and increase blood pressure, but later lower the blood pressure, diminish the energy of the heart, and lessen the rate of the movement of the vital fluids. Hot applications are seldom required for this purpose, though the neutral bath is sometimes useful in quieting excessive activity. It is important to bear this fact in mind whenever it is thought necessary to employ hot baths in cases in which there is pronounced cardiac weakness, so that excessive or prolonged general hot applications may be avoided. Being thus forewarned, it is also possible to guard against cardiac failure by the application of the cold precordial compress during the hot application. This is very often necessary in the administration of the vapor bath, the electric-light bath, and especially the

Russian and hot immersion baths, in cases of cardiac disease.

Cold applications first quicken, then slow the action of the heart, raise the blood pressure, and increase the movement of the blood and the lymph through their proper channels in all parts of the body.

Measures Which Increase Heat Production.— That cold applications to the skin promote heat production has long been recognized as a thoroughly established fact. The processes of thermogenesis, or heat production, are brought into play through the impression of cold upon the thermic nerves of the skin. The more intense and prolonged this impression, the greater the effect in increasing heat production. The most intense effects are produced by prolonging the application until the temperature of the body has been slightly lowered. If the application of cold is greatly prolonged or is repeated at short intervals, the thermogenetic reaction fails, and the depressant effects of cold appear.

Measures Which Increase the Elimination of Heat.—Increased heat elimination is indicated in nearly all cases of fever, as it has been shown by Winternitz that in febrile disorders the elevation of temperature is due less to increased heat production than to decreased heat elimination. The measures most essential are such as will maintain active cutaneous circulation, while at the same time cooling the skin. This may be accomplished by vigorous rubbing in a cold immersion bath,— the so-called Brand bath,— by the rubbing wet sheet, the wet-sheet pack, very short hot applications followed by short cold applications to the surface, the cold friction bath, the cold towel rub, cold water drinking, the cold enema, cold applications to the spine. In certain cases the hot blanket pack, the hot evaporating sheet, and various other measures may be usefully employed.

Measures Which Relieve Pain and Nervous Irritability.—Nervous irritability and pain may be most successfully combated by hydriatic applications, which are not only successfully directed to the removal of the cause, but also act efficiently in palliation. The general neutral bath and the neutral douche are marvelously efficient in relieving nervous irritability, and inducing sleep, not only in chronic forms of insomnia, but the neutral bath or pack in the delirium and vigil of acute fevers. The moist abdominal bandage, cool headcap, and in certain cases the heating spinal compress, are equally useful. The fomentation and the heating compress are as useful in relieving localized pain and diminishing local irritability, whether cutaneous or visceral, as are cold applications in arousing activity in sluggish parts. The cold compress and the ice compress are likewise useful in relieving pain in superficial parts to which these applications may be made directly.

Measures Which Combat Bacterial Development.—The development of invading bacteria in cases of infection may be delayed by prolonged applications of cold when it is possible to make the application directly to the parts involved. When deeper parts are affected, the growth of parasites may be combated by increasing the alkalinity of the blood by means of general cold applications, and by the application of measures which have already been described as favoring local leucocytosis, such as the frequently renewed heating compress and the alternate compress. These measures, by increasing the movement of the blood through the affected parts, bring constantly into contact with the growing bacteria fresh supplies of alexins and antitoxins, whereby their growth is discouraged, while at the same time the white cells are actively engaged in capturing and destroying the parasites.

Means of Controlling Blood Movement and Volume.— Stasis of the blood and lymph encourages morbid processes by favoring the development and the accumulation of waste and toxic substances in the tissues, thus leading to perverted metabolism or unhealthy tissue formation, and by weakening the resistance of the cells, which become asphyxiated by the accumulation of CO_2 and poisoned by their own excretions, so that they are unfitted for combat with the invading parasites.

The same measures which have been described as encouraging leucocytosis may be successfully employed in combating stasis of the blood in inflamed or congested parts. Derivative measures, the cold compress over the affected viscus, the Scotch douche, and revulsive measures of all sorts, are indicated.

Measures Which Lessen Heat Produc-

tion.— Heat production, which must be discouraged in febrile states, is best inhibited by short hot applications to the surface, and by prolonged or frequently repeated cold applications. The short hot immersion bath, the hot blanket pack, fomentations to the spine, the hot evaporating sheet, and the short hot immersion are the best means of applying heat for this purpose. The graduated bath, the prolonged tepid bath (88°), and the cooling pack are the best cold applications for diminishing heat production.

Measures Which Lessen Heat Elimination.— It is seldom necessary to discourage heat elimination, except in cases of syncope, in which the dry pack, the hot blanket pack, the hot enema, and hot water drinking are efficient means of preventing excessive heat loss, and an aid to nature in accomplishing the end which it is sought to gain, by contraction of the peripheral vessels. When hot applications are made, great care must be taken to avoid exposing the patient during the changing of the application or after it has been removed. It is wise to alternate the hot application by a short cold application, with friction, vigorous cold wet-hand rubbing, and cold mitten friction.

General metabolic activity is diminished, first of all by maintaining absolute rest in bed. The neutral bath is an efficient measure for the same purpose. Renal activity is increased by imbibition of water through the skin, but general metabolism is, on the whole, diminished through the lessening of the cutaneous reflexes whereby the vital machinery is excited to activity. In cases of hypopepsia, intestinal, uterine, and vesical catarrh, overexcitation of the secreting glands may be lessened by withdrawing the blood from the part by the various derivative measures which have been elsewhere pointed out.

The discussion of general indications might be prolonged almost indefinitely, but the foregoing will suffice to give the reader a grasp of the general principles involved, which will enable him to work out for himself any therapeutic problem which may arise.

Distilled Water as a Food.— Ephraim Cutter, in a paper on this subject (*Jour. Am. Med. Asso.*, May 26, 1900), concludes as follows: "Water by itself or inhaled in the air passively and constantly is a food indispensable to all mankind. If so, why feed 'calculi' patients on waters which add to the already overloaded collections? Distilled water properly aërated is the best for such rheumatics and asthmatics; if Germans have been poisoned by distilled water, it is a very remarkable idiosyncrasy in those who have figuratively more vitality, more strength . . . than Americans. . . . Water is a solvent in biology: the purer it is, the better will water wash out the viscera, dissolve calculi, ease the flow of blood through the more than one hundred thousand miles of capillaries in the system, promote osmosis, soften tissues, accelerate secretions and excretions, equalize all circulations, aid cerebration, cardiation, digestion, metabolism. Distilled water is free from bacteria, yeasts, epithelia, loaded or not with cryptogamic diseases; whatever gets in from the morphology of the air of the kitchen can not be so deleterious as some aver, because the culinary queens inhale it all the time, harmlessly.

"The writer hopes it will become the fashion to 'treat' people with distilled in the place of undistilled water and spirituous liquors, as he found it appetizing, satisfying, going to the right spot, clean tasting, and beautiful to the eye as well as the palate, wholesome and never intoxicating (toxa-poison), as our experience proves with the Americans and English, though Dr. Koppe asserts it has. I respect him, but do not accept what he says, as it does not tally with the facts here given."
—*Medical Times, September, 1900.*

Coffee Intoxication.— The *Medical Times* contains the following statement from Miss Ward, who writes from Brazil: "The whole country is perpetually in a state of semi-intoxication from coffee — men, women, and children alike; and to babies in arms it is fed from a spoon. It is brought to your bedside the instant you awake in the morning, and just before you are expected to drop asleep at night, at meals and between meals. The effect is plainly apparent in trembling hands, twitching eyelids, mummy-hued skin, and a chronic state of excitability worse than that produced by whisky."

TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

THIRTEENTH INTERNATIONAL CONGRESS OF MEDICINE, HELD IN PARIS, AUGUST 2-9.

THE first question on the program of the section of Internal Medicine was concerning the pathogeny of gout. The discussion was introduced by Dr. Le Gendre, Physician to the Tenon Hospital, Paris, Sir Dyce Duckworth, and Professor Wilhelm Ebstein, of Gottingen. The following are abstracts of their reports: —

Dr. P. Le Gendre said that since the uratic nature of tophi and uricemia in gouty subjects had been determined, the efforts of theorists had almost always had as their object an explanation of the pathogeny of gout by accumulation of uric acid in the economy, and the precipitation of urate of soda in the tissues. The author rapidly reviewed the principal theories; namely, the introduction in excess of uric acid by food or of nitrogenous substances generating uric acid; the formation in excess of uric acid by destruction of the nucleins of nucleoalbumins proceeding from the leucocytes or from the nuclei of all the cells in the body; the accumulation of uric acid by insufficiency of transformation into urea, whether through torpidity of the liver, or default of a ferment permitting it to fulfill its uropoietic function, or by inadequate oxidization throughout the organism; the retention of uric acid in the blood by insufficiency of the eliminatory function of the kidney, the resorption of uric acid in the kidney, which, being supposed normally to have the function of effecting by certain of its cells the formation of uric acid by combination of the urea and glycocol proceeding from the liver, would become incapable of eliminating the acid formed. This being reabsorbed, would in the blood become quadriurate of soda, which being present in superabundance, precipitates itself under certain influences in the tissues in the state of biurate of soda. Some hold that the presence of urate of soda in the articular tissues sets up therein only a paroxysmal inflammatory reaction as a foreign body. Others maintain that the uric acid acts as a chemical poison causing necrosis, and that the preliminary mortification of the tissues is necessary to the formation of the crystallized uratic deposits. Some explain the gouty localizations by the smaller vascularization or the less resistance of predisposed tissues, and the onset of attacks by the hindrance of the renal functions. Others attribute the localizations, paroxysms, and metastases to a nervous influence. It has also been believed that uric acid was hurtful only after having undergone certain physical or chemical modifications, and that a pathogenic rôle should be attributed equally to substances other than uric acid, such as alloxuric bodies. Each of these theories is open to valid objections, chemical, physiological, or pathological; the most plausible, moreover, can explain only the mechanism of the gouty paroxysm, not the permanent and hereditarily transmissible disturbance of cellular transmission, which is the necessary link between the intermittent morbid phenomena in the individual, as between the disease of the father and that of the son. Clinical statistics, however, have placed it beyond question that gout is observed with a special frequency in individuals whose ancestors or descendants suffer from diseases of the so-called arthritic group or from trophic inadequacy. First, diabetes and obesity, and gout is often associated with some of these diseases in the same person. The numerical relations established between diseases of the arthritic group warrant us in attributing to each of them the pathogenic process which has been shown to be true as regards one of them by Bouchard, after whose investigations it is no longer permissible to doubt that diabetes consists in a diminution of the aptitude of the tissues to burn up sugar, to carry to the extreme the transformations of carbohydrates. If, clinically, gout is of the same nature as diabetes, there is a great probability that there exists in the gouty subject a defective elaboration of nitrogenous material, an inaptitude of the tissues to destroy albumin thoroughly. Among the consequences of the incomplete destruction of refuse must be included the incumbrance of the organism both by certain acids (oxalic, acetic, lactic, etc.) which can diminish the conditions of solubility of uric acid without that substance being necessarily in excess in the blood, and by

certain organic bodies the toxicity of which may contribute to the production of the manifold accidents of gout. Clinical statistics further place in evidence the morbid affinities of gout with simple albuminuria and interstitial nephritis as the frequency and intensity of the disturbances in gouty subjects. It may be inferred from these coexistencies that the functional disturbances of the kidney, as those of the nervous system, play a part in the preparation of gout and in the outbreak of its paroxysms, either by hindering the eliminations of the toxic waste products of the denutrition of the tissues, or through neurotrophic inhibition of the intracellular metabolism. When gout is acquired, the nutritive disturbance of the cells is brought about by a defective hygiene (abuse of food stuffs, nitrogenous or rich in oxalic acid, and of certain fermented drinks, insufficient physical activity, and overstrain of the nervous system), or by the action of a poison (lead). When gout is hereditary, it is that the nutritive disorder of the cells of the first begettor had been continued through the ovum or the spermatozoön in the descendants of these cells.

Sir Dyce Duckworth read á paper, of which the following is a summary: —

1. Gout as a morbid condition depends on an inherent vice of nutrition, which is manifested by an imperfect metabolism in various organs or parts of the body, presumably in the kidneys, and probably in the liver.

2. This trophic disorder or inadequacy leads to the formation of uric acid, probably in excess, and to the periodic retention of it in the blood (gouty uricemia).

3. Histology throws no light upon the intimate nature of this defect, which thus relates to cellular potentiality, possibly under neurotrophic influence, and not, so far as we know, to structural alteration.

4. This textural disability, or a tendency to it, may be primarily acquired, and also transmitted as a fault, thereby inducing from time to time uricemia with gouty manifestations in the descendants.

5. In most instances, under conditions which provoke it, and in some cases independently of these, attacks of gout may grow up and come to a crisis. Such crises are attended by an alteration in the solubility of the uratic salt in the blood, whereby irritating crystals of biurate of sodium are produced, and precipitated in various parts of the body.

6. A paroxysm of gout, the sites of its occurrence, and its metastases, are determined by nervous influences, probably dominated from the bulbar center, and the local attacks alight either in the joints or in textures which have been weakened or rendered vulnerable by impaired nutrition, owing to past injury or overuse.

7. This central neurosis is an essential and transmissible feature in the pathogeny of gout, and pertains to the arthritic diathesis generally.

8. The uricemia of gout is peculiar, and unlike that which is induced by other morbid conditions, but the occurrence of uricemia in the gouty is by itself inadequate to induce attacks of gout.

9. Uratic deposits in any part of the body may be removed in course of time, but are apt to be permanent in the least vascular tissues.

10. Uratic deposits may occur to an enormous extent in gouty persons without the occurrence of any pain or paroxysms.

11. The clinical features of gout indicate that both hemic changes (due to inherent morbid tissue metabolism) and a neurotrophic disturbance act as pathogenic factors, and consequently, gout is to be regarded as a neurohumoral malady.

Ebstein summed up his conclusions as follows: —

1. Gout is a more or less chronic disease of which the fundamental substratum is a hereditary morbid proclivity, which is almost always congenital. To this proclivity is given the name "uric acid diathesis."

2. As regards the ultimate cause of the uric acid diathesis, nothing more than hypothesis can be advanced. The intimate relations existing between the nucleins and uric acid make it probable that we have to do in the uric acid diathesis with an abnormal state of the cell nuclei or of the protoplasm of the individual proclivity, which can be followed throughout whole generations and races of men; in any case this is of the greatest importance in the uric acid diathesis.

3. It appears that there are various circumstances which may contribute to the development of the diathesis and its transformation into positive gout. Among these circumstances must be mentioned the following: (*a*) Gout develops, all the circumstances being alike, the earlier and

more intensely, the more the diathesis is pronounced; (*b*) there are habits — laziness, luxurious living, often a combination of both these causes, in the highest degree the abuse of alcohol — which favor the development of gout; the temporary variations that have been observed may generally be attributed to those circumstances; (*c*) there are acute and chronic intoxications, which, given the existence of the diathesis, favor the development of gout; bacillary poisons are in that case of great importance; relations of gout with rheumatism, syphilis, and lead poisoning should in the first place be borne in mind; influenza, too, seems to favor the appearance of gout; (*d*) contagion, which was considered a factor of the first importance by Boerhaave, appears to be of no importance; (*e*) climate seems to have no influence.

4. Uric acid seems to be the poison (the *materia peccans*) of gout. The question of knowing whether or not, besides uric acid, other products of the organism belonging to the family of the alloxurs or nuclein bases play a part, is still unsettled. It is probable that it is only the uric acid formed at the expense of the nucleinic substances of the human body, and not that formed at the expense of the nucleins of the elements, which has an influence on the pathogeny of gout. It has not yet been proved that in gout, uric acid is formed in excess, and Ebstein thinks that this is not indispensable. Nevertheless, he thinks that an excess of uric acid is very probable. The history of leucemia teaches that gout is not the result of increased production of uric acid (estimated according to the quantity of uric acid separated in the urine), for there is in some cases of leucemia a secretion of uric acid such as is never seen to such a degree in gout.

5. Uric acid is a chemical but not a septic poison. The influence of the poison is not equal either on different animal species or on animals of the same species differing in age. Inflammatory and necrosing changes of the tissues in question are the necessary consequence of the presence of uric acid, which finally causes a complete necrosis. When the tissues are utterly dead, but not before, the acid is deposited in them in the form of crystallized acid urate of soda (mononatrium urate, Tollens) (sodium biurate, Roberts). Tollens thinks that the uric acid circulates in the blood and the alkaline juices of the human body in that same form, and not, as Roberts has supposed, as sodium quadriurate (called more rationally hemi-sodium-urate by Tollens). It may be admitted without hesitation that the mono-natrium-urate (Tollens), natrium-biurate (Roberts), may be deposited in a crystalline form in the tissues necrosed either by uric acid or another poison.

6. To understand the pathogeny of the different symptoms of gout one must assume (*a*) a primary articular gout, (*b*) a primary renal gout. The former is the most widespread form of gout which does not prevent its subjects from reaching an advanced age. Primary articular gout develops itself first under the influence of a retention of uric acid; this retention is localized because it affects only one or more parts of the human body. In primary renal gout we have to do from the first with a generalized retention of uric acid, which consequently affects all parts of the body; it is always caused by a primary and material change in the kidneys. — *British Medical Journal, Aug. 11, 1900.*

SYMPTOMATOLOGY, DIAGNOSIS, AND CLINICAL COURSE OF MUCOMEMBRANOUS COLITIS.

DR. F. BOAS, in an address before the Thirteenth International Congress of Medicine, dealt with the above subject as follows:—

1. By mucomembranous colitis we understand a special catarrhal disease tending to plastic mucous formations of the colon.

2. In addition to this form, which is the most frequent, there is another, more rare, in which the process manifests itself in paroxysms, while in the intervals there is no noticeable malady except constipation; this form is denoted by the term mucous colic.

3. Lastly, there is a third form which may be designated by the name of artificial mucomembranous colitis. By astringent injections, especially tannin, this form may be induced in persons who are the subjects of colitis, but not in healthy individuals.

4. The symptomatology of mucomembranous colitis includes constipation

colic, spasmodic atony of the intestines, glairy or membranous masses in the stools, and a general neurotic state; nevertheless, several of the symptoms may be wanting; the only one of them that is almost constant is constipation.

5. That which alone determines the diagnosis is the existence of characteristic mucous masses; the other symptoms—sensitiveness of the colon, coloptosis, movable kidney, and atony of the intestine—at the most can only help to confirm the diagnosis.

6. It is indispensable that it should be ascertained whether the mucomembranous colitis is an idiopathic condition or a complication; it is equally of great importance to ascertain whether the membranous colitis is of artificial origin.

7. In regard to the differential diagnosis, the only alternative that need be considered is mucous colic; by frequent observations and methodical intestinal injections in the intervals, it will almost always be possible to come to a decision.

8. The clinical course of mucomembranous colitis is absolutely parallel to that of habitual constipation; influences which correct the latter will cause the former to disappear, and *vice versa*.

Dr. Julius Mannaberg, physician to the General Polyclinic, Vienna, dealt with the pathogeny and pathological anatomy of enteritis membranacea and colica mucosa:—

1. A distinction must be made between membranous enteritis and mucous colic.

2. By membranous enteritis is understood a subacute or chronic catarrhal affection of the large intestine, accompanied by evacuations particularly rich in mucus.

3. By mucous colic is denoted a morbid state, of which the special clinical symptoms are paroxysmal crises of colic followed by evacuation of masses of mucus.

4. It is a question whether the two processes may occasionally be combined.

5. Each of the two morbid forms, of which the only common element is the existence of mucous evacuations, has a pathogeny peculiar to itself.

6. The first form is nothing more than a catarrh of the large intestine characterized by an abundant evacuation of mucus; it has the same pathogeny on the whole as ordinary catarrh of the large intestine.

7. Mucous colic, on the contrary, has a special pathogeny. In the great majority of cases it rests on a basis of general neurosis (hysteria, neurasthenia), and there is a tendency to consider the disease as an expression of the neurosis. In the exceptional cases where there is no underlying general neurosis, the morbid state must be regarded as a mono-symptomatic neurosis of the intestine. In addition to this fundamental etiological factor, certain occasional factors capable of producing paroxysms must be taken into account. The principal among them are diseases of the genital apparatus (in man as well as in woman), mental disorders, constipation, irritating rectal irrigations, organic diseases of the intestine.

8. Mucous colic is frequently accompanied by other pathological manifestations to which its production can not be attributed, but which may be regarded as equivalents of the fundamental nervous element—gastric achylia, nervous dyspepsia, spasmodic constipation, enteroptosis.

9. The pathological anatomy of membranous enteritis is the same as that of enteritis in general.

10. As regards mucous colic in the very rare cases in which it has been possible to make an examination either on the living or the dead body, no appreciable lesion of the mucous membrane has been found.—*Boston Medical and Surgical Journal, Sept. 6, 1900.*

A REMARKABLE INSTITUTION.

THE following words of appreciation are quoted from the September number of the *Monthly Cyclopedia of Practical Medicine and Universal Medical Journal:*—

"While three thousand physicians of the United States and Canada have manifested a high degree of confidence in the Battle Creek Sanitarium by sending patients there, it is probable that the vast majority of practitioners of this country know of this institution only in a general way.

"For a great many years it has been the ambition of the managers of this Sanitarium to provide, in the highest degree of perfection, every form of material, every convenience or appliance, and every

possible remedial agency that could be employed for the benefit of any individual case out of the great number of patients treated at that institution annually.

"Concerning the robust it is often said, 'What is one man's meat is another man's poison,' and this applies with added force when the vitalities have become seriously depressed. Each patient visiting the Battle Creek Sanitarium is subjected to the most careful examination, with a view to making such an intelligent, individual study of the case as will eliminate in every possible manner the application of what may be termed 'machine' methods. The results are often astonishing to the highest degree. Whatever the nature of the malady, the Saniturium has some specially devised method of treatment intended for that individual type of case, whether it be in the form of massage, balneology, gymnastics, or dietetics. The superintendent, Dr. Kellogg, has attained reputation as an authoritative writer on a variety of subjects, and his relations with the profession are such that he is constantly in touch with the latest ideas in medical and surgical treatment.

"The Battle Creek Sanitarium is the parent institution from which ramifications extend to all parts of the world. Sustaining, as it does, this relation to its large number of branches, it is but natural that the general superintendent should wish to put to personal test all ethical methods of treatment which, in his opinion, are practical.

"A prominent feature of the treatment employed at Battle Creek in numerous forms of disease is the dietary recommended. In order that each patient may receive as near as possible the most rational form of nourishment practicable, numerous food preparations have been manufactured, under the formulæ of the superintendent, which have become quite a prominent feature of the plan of treatment. In a large number of forms of invalidism, one of the most desirable things to secure is change,— absolute change. This the patient can be sure of who visits the Battle Creek Sanitarium, but, while the mode of life is radically different from the home life, such is the careful consideration of each patient, as before suggested, that there is nothing depressing in the change. The sojourner at the Battle Creek Sanitarium feels immediately that he is the subject of careful supervision, and develops an immediate ambition to co-operate intelligently in the attempt to build up his physical capital.

"The Battle Creek Sanitarium differs from every other institution of its kind, and, while devoid of spectacular interest, and conducted under the strictest ethical regulations, it is well worth a visit from any physician who may chance to be within a reasonable distance of Battle Creek."

THE ZOOLOGICAL AND GEOGRAPHICAL DISTRIBUTION OF TUBERCULOSIS.

Dr. W. A. Evans (*Plexus*, June) summarizes his studies in this subject as follows: —

1. Every animal having tuberculosis is a center for the maintenance and spread of tuberculosis. We must admit great variance in danger, according to the animal affected. The danger from the cow, by reason of the fact that we drink milk uncooked, is great. The danger from the horse is much less. In spite of this variance, the proposition commends itself. All of the excreta and the excretions at times contain tubercle bacilli. These either go directly into man, there to run the gamut of his defense, or they go into the world, there usually to perish, but sometimes to persist, and threaten men and other animals.

2. Neither animal nor aviary tuberculosis is identical with, although related to, human tuberculosis. The translation of human into animal and aviary tuberculosis and vice versa is also possible. The first part of this proposition is allowed by everybody. With regard to the second part, Theobald Smith's work seems to show that while there are structural and biological differences between the bovine and the human bacillus, the differences are not of great pathological importance. This is borne out by cases of infection of people from bovine bacilli and of cows by human bacilli.

3. Inhalation and ingestion are the most frequent means by which tuberculosis is spread from man to man, from man to animals, and from animals to man.

4. The geographical distribution of

tuberculosis is proof that the organism's extra corporal or saprophytic life is of secondary importance. Argument in support of this proposition is found at every step by the bacteriologist. If the bacillus is found regardless of temperature, of soil moisture, of total rainfall, or elevation from the sea level, of prevailing winds, then it must follow that its essentials are to be found in the body, where environment is more uniform. Nuttall's observation, that the number of tubercle bacilli expectorated in the twenty-four hours is about three billions, would prove that only an infinitesimal number live outside the bodies of animals. The lesser number of cases at great altitudes, away from cities in dry climates, etc., is due to the improved condition of the people and of their hygienic conditions, such as lack of crowding, well-ventilated habitations, out-of-door life, vigorous existence, etc., rather than to difference in bacilli or difference in the effect on bacilli of their extra corporal environment. However, we can not altogether deny the effect of sunshine and drying on the bacilli that lie exposed.

5. There is abundant evidence that the bacillus is modified by the bodies through which it passes. Such is the teaching of the work of Bang, of Smith, of Nocard, of Jones, and many others.

6. While proposition No. 5 is incontestable, there is no evidence that the disease will disappear by reason of a general immunity. In the contest waged between the system and this organism, the wandering cells and the chemical substances of the body play a lesser part than in almost any of the infectious diseases. Protection is had by reason of the activity of the fixed tissue cells of the body. In those diseases which are due to organisms violently poisonous to the human body, the reaction is sharp, and cure or death speedily results. The very mildness of tuberculosis is responsible for its ultimate severity. The fact that the system takes so little cognizance of it constitutes the difficulty. In consequence, special immunity is less a factor than in any other infectious disease. The general immunity that comes from great good health and resisting power must be allowed by all.

7. The decrease in the death-rate from tuberculosis is more apparent than real. While fewer people seem to be dying of tuberculosis than formerly died of it, the proportion between the death-rate from tuberculosis and the death-rate from other diseases is not decreasing. In this connection we must bear in mind the fallacy of taking, without great caution, statistics that antedate 1880. If we limit our comparisons to the period since 1890, we shall find no material decrease.

8. Tuberculosis is, above all, a disease of crowding, and therefore a disease of cities. The disposition of the age is toward city life, and therefore a slight decrease or even no increase in tuberculosis constitutes a gain.

9. At some future date in determining the question of favorable location in order that a man may escape tuberculosis himself, shield his family from it, or get well when once the disease has been contracted, we must ask the following questions: (1) What is the altitude? (2) What is the percentage of sunshine and cloud? (3) What is the soil moisture? (4) What is the atmospheric moisture? (5) What is the population per acre? (6) What is the amount of tuberculosis present in men? (7) What is the amount of tuberculosis present in animals and birds? (8) Is the mean temperature approximately that of the district from which the man is to go?—*New York Medical Journal, Sept. 8, 1900.*

COLD WATER AS AN ANTITUBERCULOUS TONIC.

THE *Gazzetta Medica Lombarda* for July 15 says that water is the best of all tonics, and after so many years of continued experiment it becomes more in evidence as a prompt and conspicuous means of stimulating the appetite and blood production, augmenting the muscular vigor, and increasing nervous tone and metabolism. Cold water, in short, extends its influence to the innermost recesses of the organism. Its action, according to the *Gazzetta degli Ospedalie e delle Cliniche* for July, is rendered yet more beneficial by re-enforcement with proper dietetics; like the constant use of pure air and sunlight, this measure facilitates the counterbalancing of retrograde by progressive metamorphoses, thus putting a stop to the progress of phthisis.

Analyzing closely the effects of this tonic, we find that it particularly acts as a regular gymnastic measure to the peripheral terminations of sensory nerves, and also to the vasomotors, which facts lessen the vulnerability of the tuberculous to catarrhal affections, and therefore diminish the preparation of the soil for the invasion and progress of the bacilli. For this reason, also, this measure proves most useful in local tuberculous processes.

The points aimed at to combat and overcome the debility of the pulmonary circulation are: (1) Re-enforcement of cardiac energy; (2) elevation of tone in the vessels and tissues, inducing at the same time collateral or active hyperemia of the diseased organ; (3) increase of formative activity in the region of the diseased organ; (4) re-enforcement of the entire organism, particularly from the point of view of innervation and circulation. Not uncommonly hemoptysis, fever, and night sweats disappear under hydrotherapy. Winternitz cites the case of a Swedish physician who as the result of great experience was convinced that tuberculosis was curable by cold water. In Africa he contracted a malarial fever which entirely resisted quinine, and yielded only to the systematic application of the cold douche. Going from there to Buenos Ayres, he was, while in the practice of his profession, attacked by repeated hemoptysis, fever, and night sweats. Having at that time no faith in any treatment, but in order to do something, he took to cold douches. He found them of prompt service, and discovered that they were beneficial in proportion to the coldness of the water. This led him to add ice to the water. By these measures he was cured, and from that period he espoused with enthusiasm the cold-water treatment of tuberculosis. After twenty-two years' experience, he proclaimed in 1890, the curability of phthisis by the following measures: First, a partial washing with water at the freezing point; later, affusions with such water; repeated general washings two or three times a day; finally, immersion in baths at a temperature of 44.6°F., or at most of 55°F. Aberg believes that no contraindication to this method exists; it tends to cure all those who are susceptible of cure, and ameliorates the condition of the incurable, relieving their subjective disturbances. Winternitz uses a method differing but little from that of Aberg. He lays down as the cornerstone of the utility of his method a prompt and complete reaction, which he seeks to obtain with the lowest possible temperature, supporting it with adjuvant chemical and mechanical measures. A supplementary measure is the use of counterirritants, which he applies over any spot where catarrh or specific infiltration exists. After treating upward of four hundred patients by hydrotherapeutics during a space of thirty years, he has come to the conclusion that apart from its enormous prophylactic value (so great that he would have it become general in all institutions, factories, barracks, etc.), its results from the therapeutic point of view may be thus stated: In eighty per cent of cases, an arrest or relative cure of the disease, with increase of weight; while in phthisis florida a less permanent arrest, with also some relative cure in thirty-two per cent.—*New York Medical Journal, Sept. 8, 1900.*

An Easy Method of Removing Plaster of Paris Bandages.— According to the *Medical Times*, plaster of Paris bandages may be easily removed by the following simple method: Soak some cotton-wool in peroxide of hydrogen, then with this moisten the splint down its entire length and for a width of about half an inch. When it is thoroughly soaked, the plaster will be found in the same condition as when first put on, and the bandages have only to be cut with a pair of scissors, without any injury to the patient or any trouble whatever.

Hiccough Successfully Treated by Traction of the Tongue.— Noir (*British Medical Journal*, March, 1900) states that he has successfully treated several cases of hiccough by Laborde's method of vigorous traction of the tongue. One case which had lasted for six hours was arrested by traction of the tongue for a minute and a half. In another case of six days' standing, which resisted all forms of medicinal treatment, a cure was effected in two minutes.

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

Bacteriological Examination of Cerebrospinal Fluid Obtained by Lumbar Puncture.— Dr. Giovanni (*Riforma Medica*, Aug. 4, 1900), in a series of experiments conducted for the purpose of determining the value of bacteriological examinations of cerebrospinal fluid in the diagnosis of meningeal infections, employed cultures of different species of germs, some endowed with great motile powers, others absolutely non-motile. He began with the bacillus of typhoid fever. The skull of a dog was trephined under aseptic precautions, and half a cubic centimeter of broth-culture of the bacillus was injected under the dura by means of a hypodermic syringe, after the withdrawal, by means of another syringe, of an approximately equal amount of cerebrospinal fluid, in order that the amount of liquid in the cerebrospinal space might remain the same. The opening in the cranium was carefully closed, and at intervals of two, three, six, or nine hours after the operation, lumbar puncture was performed in the four animals. The fluid thus obtained was examined bacteriologically. The agar plates prepared with this cerebrospinal fluid were kept in incubators for forty-eight hours, and the following results noted: The bacilli of typhoid fever did not reach the spinal cavity until three hours had elapsed after the inoculation into the subdural space. After six hours they were present in the spinal cavity in moderate numbers; after nine hours they began to diminish in number; and in eleven hours they had disappeared. The writer performed similar experiments on dogs with cultures of the bacillus of anthrax, and found that after six, nine, and twelve hours, respectively, no bacilli were found in the spinal cavity, as attested by the plate-cultures prepared from the fluid obtained by lumbar punctures. In four other dogs the writer performed similar experiments with staphylococcus pyogenes aureus and staphylococcus pyogenes albus. In these animals he found the germs in the spinal cavity three, six, and nine hours after the operation of trephining, and a somewhat smaller number were present after twelve hours. In order to prove his experiments and to eliminate the possibility of a disturbance in the condition of pressure in the cerebrospinal liquid, he next repeated the entire series of tests with solid agar cultures instead of broth cultures injected into the subdural space. He concludes from all these experiments that when the subdural space is infected with a germ against which the animal is immune, the organism finds its way into the lumbar portion of the spinal cavity with difficulty. The reverse is true in the experiments with germs which are pathogenic in the animals. The motility of the germ has no relation to the time of its appearance in the lumbar region, for there was no appreciable difference between the time of appearance of the typhoid bacillus, which possesses a very marked degree of motility, and that of the staphylococcus aureus, which is non-motile. The reason of this is to be found in the fact that in the presence of cerebrospinal fluid the motility of the bacillus of typhoid fever gradually diminishes until it almost stops. This may be readily seen in a hanging-drop preparation in which the bacillus is mixed with cerebrospinal fluid.— *New York Medical Journal, Sept. 8, 1900.*

The Danger of Tubercle Infection through Milk and Dairy Products.— Lydia Rabinowitsch (*Deutsche medicinische Wochenschrift*, June 28, 1900) recapitulates the dangers to the community at large that exist in the constantly increasing number of tuberculous cattle used for the production of milk and its various modifications exposed for sale. Although for obvious reasons the general, legally enforced application of the tuberculin reaction is meeting with much opposition at the hands of the dairymen, it still represents the best and the most reliable test, and it is only by its rigid employment that an absolutely tubercle-free milk supply can be obtained. This is conclusively shown by the author's investigation of the product of eight Berlin dairies supplying at an increased price what is ostensibly a germ-free milk, to be used for children and invalids. In three of these establishments, the tuberculin test is regularly applied, and the milk furnished was found uncontaminated by the bacilli. In the other five dairies, clinical

observation is depended upon to detect disease in the cattle; repeated examination demonstrated the presence of active virulent tubercle bacilli in the milk of three of these. The author's investigations were carried on to a study of various other dairy products. "Plasmon" (Siebold's milk albumin) was found free from pollution, but pot cheese and kephir both furnished virulent cultures. Margarin and its modification, "sana," being prepared from beef suet and containing no milk, are supposably free from danger of infection, but the author calls attention to the facts that the fat used in their manufacture may easily contain diseased lymph glands, and as a matter of fact the two samples examined were found to give positive results bacteriologically.— *Medical Record, July 21, 1900.*

Note on a New Medium for the Growth and Differentiation of the Bacillus Coli Communis and the Bacillus Typhi Abdominalis.— A. T. Macconkey (the *Lancet*) says that in this medium, advantage is taken of two well-known facts: (1) The salts of bile are precipitated by acids; and (2) the bacillus coli communis produces acid in the presence of lactose, while the bacillus typhi abdominalis does not. The composition of the medium is sodium glycocholate, 0.5 per cent; peptone, 1.5 per cent; lactose, 0.3 to 0.5 per cent; agar, 1.5 per cent; tap water, q. s. The lactose is added after filtration. If stab cultures are made in this medium with bacillus coli communis and bacillus typhi abdominalis and incubated at 42° C. for from twenty-four to forty-eight hours, it will be found that the tube inoculated with bacillus coli communis has become cloudy, while the tube containing the bacillus typhi abdominalis remains quite clear. If glucose is used instead of lactose, both tubes become cloudy, but the cloudiness due to the bacillus coli communis begins from below, and that due to the bacillus typhi abdominalis from above. In plates made with glucose-medium incubated for forty-eight hours at 42° C. and then left from three to four days exposed to the light at room temperature, the colonies gradually become orange colored.— *Medical Record.*

Bacteriology of Acute Articular Rheumatism.— Triboulet, comparing clinical findings with those of bacteriology, establishes that simple uncomplicated rheumatisms are amicrobian, while the grave complications are evidently secondary infections. Bacteriology will in time determine, among the clinical varieties, those of lesser importance, which leave no pathological defect, and those which may leave permanent lesions, and prove fatal. Research should now be directed to establish the connection between this or that clinical complication and the various microbian infections. It seems probable, according to our present knowledge, that the staphylococcus and streptococcus induce moderate infections, that the presence in the blood of the diplococcus described by the writer may confer a character of subacute permanence on the rheumatism, while Achalme's bacillus is rarely met during life, but is found at the autopsies of the prolonged or fulminating cases in which polyinfection is frequent.—*Jour. Am. Med. Asso., April 21.*

Cancriameba Macroglossa.— Eisen (N. Y. *Medical Record*) describes the organism that he believes he has isolated in cases of cancer, to which he gives the above name, and which he thinks identical with that of Plimmer. He claims that it is found in all epithelial carcinomata, and is the cause of the characteristic structure of the cell nests or cell plugs. These are due to the efforts of the epithelial cells to fence in the organism in the constant struggle going on between them. The propagation of the ameba is by spores and amitotic division. Mitotic division has not been observed excepting in epithelial cells. The cancriamebæ are nearly always surrounded by small vacuoles caused by destruction of epithelial cells by the parasites. They finally enlarge and make a pus cavity. They are distinguished from leucocytes by their larger size, frequently exceeding twenty-five to thirty microns in length. A peculiarity of these is their sensitiveness to cold, which suggests a freezing treatment of carcinoma.—*Journal of the American Medical Association.*

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THE HYDRIATIC METHOD VERSUS DIGITALIS IN ACUTE ALCOHOLISM.

SEVERAL medical journals have discussed the propriety of administering tincture of digitalis in large doses as a remedy for acute alcoholism. The risk accompanying the use of digitalis is probably less than that from the old method which required the use of huge doses of bromide of potash and chloral, with the addition, if necessary to quiet the patient, of morphia, hypodermatically; but hydrotherapy affords a still better method of dealing with these cases.

As the editor of the Charlotte *Medical Journal* suggests, the use of half-ounce doses of tincture of digitalis given every four hours "looks somewhat like substituting poisoning by digitalis for poisoning by alcohol, which is only swapping the witch for the devil." Hydrotherapy is certainly not open to this criticism.

A number of years ago the writer had opportunity to observe the effects of hydriatic methods in a large number of cases of acute alcoholic intoxication, and has during the last twenty-five years had constantly under his professional care a larger or smaller number of chronic inebriates who by occasional relapses during the early stages of treatment have afforded opportunity to test methods for dealing with acute alcoholic poisoning. The hydriatic method has certainly proved itself far superior to all others, and has shown itself to be competent to deal with this class of cases with entire success. We briefly outline the method as follows:—

For alcoholic neurosis, intense cold applications followed by rubbing, the cold douche, especially the cold douche to the spine and upper part of the body; when possible, the percussion douche is the most effective means of arousing the narcotized centers. In one very striking case a man who was so profoundly intoxicated that he had to be held up to keep him on his feet, after one half minute's application of the cold douche, sprang out of the bath apartment, standing steadily upon his feet, and exclaimed, "You have wrought a miracle. I am a sober man." And he was. He could walk as straight and talk as straight as ever in his life. The cold douche must be repeated every hour until the symptoms of intoxication have passed off. The patient must be encouraged to drink freely. It is well, also, to administer a large enema.

Dr. Robertson, of Barbadoes, reported in the early part of the present century an interesting case which illustrates very forcibly the powerful influence of cold water in antagonizing the acute effects of alcoholic poisoning. The temperature of the water employed, as determined by Dr. Robertson, was 76° to 80°. We quote as follows from Dr. Currie's "Medical Reports," to which we are indebted for the account of this interesting case:—

"A gentleman of this island, whose name was Weeks, a great votary of Bacchus, was in the practice, from fifteen to twenty years, of plunging into cold water when he rose from his bottle, and of actually going to sleep in a trough full of water, with his head supported on a kind of wooden pillow made for the purpose, above the surface. When he dined abroad, and had not the convenience of his own trough, he used to strip off coat, waistcoat, and shirt, and sit exposed in the open air, and in that situation go to

sleep, whether it rained or not. And sometimes he went and bathed in the nearest adjoining pond, to which he generally required assistance to be conveyed. The effect of this practice was that instead of experiencing debility, lassitude, headache, and nausea on awakening, he found himself cheerful and refreshed, and free from all the effects of intoxication. In the year 1789, dining one evening abroad, he got alternately drunk and sober three different times before midnight, each time recovering his sobriety by immersing himself and sleeping in cold water, and on awakening, returning to the company. The last time, after supper, he was so immoderately intoxicated that he insisted on his companions' undressing him and carrying him to the pond. They carried him accordingly in a chair, and set him up to his chin in water, where he continued upward of an hour, a person supporting him. I have this last circumstance from a gentleman of the party, whose veracity may be entirely depended upon.

"At home, however, he used, as I have already mentioned, a trough made for the purpose, with a bench in it as a pillow, having been nearly drowned when sleeping in his pond, from the negro who was appointed to watch him having himself fallen asleep. In this watery bed he would sleep, one, two, three, or even more hours, experiencing always the greatest refreshment. His wife and family, when they wished him to change his quarters, used to draw out the plug and let the water run off, when he would awake, and humorously complain of the loss of his bedclothes. At length this expedient began to lose its effect in rousing him, and one time he continued to sleep in his empty trough. In consequence of this he was seized with extreme rigors and chills, followed by a severe attack of rheumatism, which affected him a long time, and made him desist from this practice in future. But to the end of his life he was in the habit of sitting with his clothes open, sometimes quite naked, exposed to the wind and rain."

For acute alcohol-intoxication accompanied by delirium or mania, the cold wet-sheet pack and the prolonged neutral bath afford the most effective measures. The wet-sheet pack serves the purpose not only of quieting the central nervous system, but of efficiently controlling the patient. When the continuous neutral bath is employed, it may at first be necessary to hold the patient in the bath by force, but the quieting effect of the bath is such that in a little while he will usually fall into a quiet slumber. He may be allowed to remain in the bath from one to three hours, or even longer. The bath should be just warm enough to prevent chilling or the appearance of goose flesh. Gentle rubbing at intervals of from five to ten minutes may be necessary to maintain active skin circulation. A temperature of 92° to 94° is usually most satisfactory. A higher temperature excites the brain by encouraging the accumulation of heat within the body. A lower temperature produces largely an internal congestion and excitement of the nervous centers, which is to be avoided. Absorption of water by the skin aids the kidneys in the elimination of alcohol.

For alcoholic gastritis, a large fomentation over the stomach or a hot trunk pack repeated every three hours is a most efficient remedy. During the interval a heating compress should be applied. This consists of a towel wrung out of cold water (60°) placed around the body and covered with several layers of flannel. The stomach should be given complete rest during the treatment. Copious enemas of water should be administered daily, and the nutritive enema should be relied upon for nutrition. The enema should consist of two ounces of malted milk or malted nuts dissolved in hot water, with the addition of two beaten eggs and a large pinch of salt, administered four times daily.

ANESTHESIA BY SUBARACHNOIDEAN INJECTION OF COCAIN.

THE following is the technique employed by Tuffier in producing anesthesia by injection of cocain into the spinal canal, as reported by Dr. Murphy: —

"I use for these injections Pravaz's syringe, admitting of sterilization (hypodermic with asbestos piston.) The needle must be sufficiently long to penetrate easily the space between the skin and the subarachnoid space. This interval varies in length, according to the muscular development and obesity of the patient. The needle must be of platinum. It must be easily sterilized, and be nine centimeters long. The external diameter must be 1.1 mm.; the internal diameter, .8 mm. It must be solid, so as not to bend when it comes in contact with the vertebral column. Its end must have a short bevel. I employ a two-per-cent solution of cocain. This solution must be sterile and recent; old solutions must be discarded. This is important. The fluid injected must be carefully sterilized. I prepare my solution as follows: The solution is exposed to a temperature of 80° C. in a water bath for fifteen minutes; then it is kept in a temperature of 38° C. for three hours; it is again brought to a temperature of 80° C., then allowed to cool to 38° C. This operation is repeated five or six times in succession. It assures a perfect sterilization; the anesthetic properties of the cocain are not altered.

"The operative technique is as follows: The patient is in the sitting posture, both arms carried forward. The field of in- thoroughly asepticized. Locate the iliac crests. An imaginary line connecting these two crests passes through the fourth lumbar vertebræ. By injecting beneath that line you penetrate the medullary canal. As soon as you have located with the left index finger this spinous process, tell the patient to bend forward so as to make a big bag. This bending forward causes a separation of 1.5 cm., between the vertebræ on which you have your index finger and the subadjacent vertebræ. Then it is always wise to tell the patient, 'I am going to stick you with a needle; you will feel some pain, but do not move.' Make the injection with the right hand. I insert the needle to the right of the vertebral column, about one centimeter from the line of the spinous process. The needle goes through the skin, through the subcutaneous cellular tissue, through the lumbar aponeurosis, through the muscles of the sacrolumbar region, penetrates into the lamellar space, and at last penetrates into the spinal canal. As soon as the needle is in the subarachnoid space, it meets no resistance, and from it escapes a clear yellow fluid. This fluid is the cerebrospinal fluid, and escapes drop by drop. The surgeon must never inject a solution of cocain before he has seen the cerebrospinal fluid escape through the needle. After he has seen this fluid escape through the needle, he attaches to the needle a syringe containing one cubic centimeter of a two-per-cent solution of cocain. The injection is made slowly; it should be completed in one minute. The dose injected should not exceed fifteen milligrams of cocain. I always employ a two-per-cent solution. The injection terminated, I rapidly remove the needle and close the needle puncture with sterilized collodion. Note the precise minute at which the injection is terminated, and then wait. The patient can be questioned as to the subjective sensation which he experiences. After a certain lapse of time, which in our observations varied according to the subjects from about four to eight minutes, the patient will complain of a tingling sensation and numbness of the feet. This numbness extends to the legs. You can now begin to operate. Gradually a sensation to pain and heat disappears. Contact sensation persists. Toward the last the motor system may be

affected. From four to ten minutes after the injection, analgesia is usually complete. Most often it extends to the thorax, occasionally to the axilla. It is not an approximate analgesia; it is complete; it is absolute, so much so that in a thigh amputation we asked the patient to elevate his stump so that we could better secure the vessels. In the course of the operation the patients, when questioned, would say that they felt only a sensation of contact."

HOW THE SKIN FIGHTS GERMS.

THE methods by which the body defends itself against the attacks of microbic enemies is a subject of perennial interest. In a recent work, "Les Defenses Naturelles de l'organisme Leçons Profeséss," Charrin has admirably summed up the various defensive activities of the body, and has made a volume of most thrilling interest. Sabouraud has given special study to the defensive functions of the skin. His work is thus admirably summed up by the *British Medical Journal* (Aug. 4, 1900):—

"The skin has two lines of defense — the epidermis and the dermis. The epithelial cells act by keratosis, the fibrous cells by fibrosis, the leucocyte by phagocytosis. These functions are clinically represented by exfoliation, deep induration, and suppuration, respectively. These simple phenomena are the essential means by which the skin defends itself, and are the result of hyperactivity of the normal functions of each element concerned: (1) The defense of the epidermis by itself is effected by the Malpighian cell, this giving birth to a series of similar cells, which are subsequently converted into horny cells; examples of this reaction are seen in pityriasis and dry eczema; (2) the defense of the epidermis by the leucocyte is effected in three situations; (*a*) in the superficial horny layer, (*b*) in the mucous layer, (*c*) in the dermis. The earliest lesion of psoriasis is an example of the first situation. This lesion, according to Monroe (whose paper may be found in the *British Journal of Dermatology* for February), consists of a minute collection of leucocytes between the layers of the horny epithelium; this is followed by hyperkeratosis, and the scale so found is thrown off with the minute abscess. This process in a section shows many of these microscopic abscesses, reduced to dried nuclei of leucocytes, between the layers of horny epithelium. Although no micro-organism has, so far, been discovered for psoriasis, there is little doubt that this process is one of reactionary defense caused by microbes in the horny epithelium. The vesicle of eczema is an example of microbes situated in the deeper layers of epidermis. Here the microbes can multiply more easily, and around them gathers a great afflux of leucocytes (chemotaxis); serum is exuded, and a vesicle formed. The struggle between the leucocyte and the microbes goes on in and around the vesicle, and the deeper layer of the mucosa forms a new epidermis beneath. The vesicle dries up, and the leucocytes and microbes are cast off together. When the microbes reach the derma, by injury in or through the hair follicles, the defense is almost solely by the leucocytes. Acute dermal abscesses and boils are examples of this, the third degree. The defense of the connective tissue by itself is effected by proliferation of the fixed connective tissue cells so as to form a fibrous sheath around the microbic focus. The wandering connective tissue cells line this fibrous capsule, and form the so-called 'epithelioid cells' of the 'pyogenic membrane.' Within the nodule the leucocytic defense goes on, but in a chronic affection of the skin differs from the process in acute affections in the tendency to the formation of giant cells, the replacement of the polynuclear cells of the primary suppuration by mononuclear fibroid cells, the final

fibrous organization of the nodule. These changes are probably due to degeneration of the migratory cells owing to their altered conditions of existence, being cut off from their surroundings by the fibrous capsule. This process of fibrosis destroys the microbes and leucocytes together. When skin lesions are regarded simply as the result of destruction of tissues by microbes, their histopathology is incomprehensible, but if regarded as a cellular reaction of the organism against invasion, the phenomena are easy of comprehension. Such skin lesions may be more easily systematized by an understanding of the morbid reactions of the structures involved."

A PRACTICAL HINT IN THE TREATMENT OF CONSTIPATION.

THERE are few physicians who have had any considerable experience in the treatment of constipation who have not become thoroughly disgusted with the routine use of saline laxatives, whether in the form of the ordinary pharmaceutical preparations or carbonated saline mineral waters. The fatal objection to the use of laxatives was pointed out by Sir Andrew Clarke, who showed the importance of the retention of a certain amount of solid fecal matter in the intestine to act as a normal stimulus to a rhythmical evacuation. The fluid stools produced by the salines and most other purgatives result in the complete emptying of the colon, so that the necessary consequence is an interruption of the natural rhythm of the intestinal movement and the aggravation of the disorder for which the remedy is administered. The large warm enema is open to precisely the same objection, and it is for this reason that many persons who have adopted its use are obliged to continue it. The warm temperature at which it is administered, relaxes the intestine, while the large quantity introduced mechanically dilates the colon. The neutral temperature abolishes the reflex action to a large extent, so that the intestine is simply washed out mechanically. The use of saline and other laxatives may be almost said to be an unmitigated evil. Certainly there are only a few instances in which these remedies offer any real advantage.

The enema may often be used advantageously only as a means of training the bowel to normal activity. The temperature employed should be 70°–75°. The quantity administered should be as small as possible, barely sufficient to accomplish the result desired. The quantity of water administered may be at first from one quart to three pints, which should be diminished daily until one pint or even one-half pint is all that is required. The enema may then be dispensed with altogether, or it may be administered at night, to be retained, instead of in the morning. In some instances it is better to administer the enema in the morning before breakfast, retaining it until after breakfast. This gives the sluggish intestine a little more time to move the accumulating fecal matters from the cecum down to the lower portion of the colon. Except in cases in which there is evident accumulation of hardened fecal matters in the cecum, no attempt should be made to empty the entire colon. It is necessary that the food residue be retained for some time in the colon in order that the nutritive elements of the food be thoroughly absorbed.

A LESSON FROM HINDU TEETH.

IT has long been recognized by dentists that the use of flesh food is a prolific cause of decay of the teeth. Caries of the teeth is due to destruction of the teeth by the growth of microbes. These microbes require for their development the proteid substances which are found in meat or other animal substances. When

flesh is used for food, the small fibers which become fixed between the teeth constitute the best possible culture-ground for teeth-destroying microbes. It is for this reason that dentists are so careful to instruct their patients to clean their teeth by drawing threads between them.

Dr. Egbert, who has made a careful study of the teeth of the natives of India, in an article in the *British Journal of Dental Science*, states that although he has examined the teeth of hundreds of Hindu natives, he has never found a single case of malformation, and that the teeth of the Hindu people are remarkably free from decay. They rarely lose their teeth from caries. He attributed this remarkable immunity from a disease which is coming to be almost universal among Americans and English people, in part to the cleanly habits of the Hindus, who carefully cleanse their teeth with a primitive but efficient brush every day, not only as a matter of hygiene, but in obedience to the laws of their religion.

He also calls attention to another and still more important factor, the absence of flesh food from the dietary of the Hindu. The rapid decay of teeth manifest among the people of the United States, which threatens to render us a toothless race within a century, is without doubt very largely due to the rapid growth of flesh eating in this country.

Albuminuria and Floating Kidney.— C. Menge reports a number of observations in which albumin and blood were shown in the urine as the result of examination of a floating kidney. The morbid elements disappeared afterward. Massage of the kidney must be avoided. Replacement of the organ in cases of enteroptosis by means of abdominal massage must be done with great care.

Method of Filaria Infection.— It is coming to be well known that the blood parasite, the filaria, is communicated to man by mosquitoes. Dr. Geo. C. Low has found that when the filaria is present in mosquitoes, it is found in the proboscis. The head is invariably in advance, and there are generally two filariæ together, "tête-à-tête." The filaria is communicated through the bite.

PAMPHLETS RECEIVED.— "Degenerative Results of Defective Heredity." Chas. Denison, A. M., M. D., Denver, Colo.

PUBLISHERS' DEPARTMENT.

THE USE OF HYDROZONE AND GLYCOZONE IN GASTRIC AND INTESTINAL DISTURBANCES.

W. H. VAIL, M. D. (*Medical Mirror*, December, 1899), states that he has obtained satisfactory results from the use of Hydrozone and Glycozone. To illustrate the great value of these preparations, the writer cites the following case:—

"A young man suffering from a severe gastroenteritis had been delirious for three days, temperature 97.6°, pulse 60, respiration 16. He was greatly emaciated, atonic, had inappetence, a severe agonizing pain in the stomach and intestines. The attacks were always of a similar nature, and occurred regularly. He was unable to take either solid or liquid food. His cheeks were hollow, eyes congested, skin pale and sallow, and his whole appearance showed the presence of intense pain.

"I was called at the end of the third week, and decided that Hydrozone and Glycozone were the remedies indicated, and gave him at once one-half glass of a mixture of one-half ounce of Hydrozone, with a little honey, to one quart of water. I continued to administer this for some time, with only a slight improvement, but after several doses had been taken, the relief was very decided. All of the acute symptoms disappeared in a few days, at which time he felt very much better, and he continued to improve without having a recurrence of any of his old symptoms. Before this both the nature and the quantity of his food had been increased. The Hydrozone and Glycozone was continued for a month after, to reduce entirely the inflamed condition of the mucous membrane of the gastrointestinal tract."

The writer praises very highly indeed the effectiveness of Hydrozone and Glycozone as germicides, and solvents of mucus. To these properties he attributes the beneficial influences obtained from the use of Glycozone and Hydrozone in gastrointestinal disorders.

A PUBLIC DOCUMENT OF SPECIAL VALUE.

THE State Board of Health has just received from the press the "Proceedings and Addresses of the Fourth General Conference of the Health Officers in Michigan," held under the auspices of the State Board of Health at Grand Rapids, Mich., Oct. 26 and 27, 1899. The publication contains contributions from a large number of sanitarians, bacteriologists, engineers, and physicians from Chicago, New York, Boston, Providence, Toledo, as well as Detroit, Ann Arbor, Lansing, Grand Rapids, and other places in Michigan. The pamphlet contains nearly two hundred pages, and is particularly rich in discussions by experts, from a public-health standpoint, of water supplies, milk supplies, bacteriological science, general and local health administration, tuberculosis, and typhoid fever. It is intended for gratuitous distribution to those laboring in or interested in that field of work, and may be obtained by making application (inclosing six cents for postage) to the Secretary of the State Board of Health, Lansing, Mich.

ANNUAL REPORT OF STATE BOARD OF HEALTH, 1898, TO BE HAD.

THE usual distribution of the copies of the 1898 Annual Report of the Secretary of the State Board of Health has been made; and there are copies of that Report which might be sent to those who are "interested in or laboring for the promotion of the public health," provided a request is made to the Secretary of the State Board at Lansing for a copy, and sixteen cents in stamps are sent, with which to prepay the postage.

THE annual convention of the Mississippi Valley Medical Association, held at Asheville, N. C., October 9, 10, 11, and 12, must be considered among the most successful in the history of the Association. Physicians were present from all parts of the country, and practically every prominent manufacturer was represented by an exhibit. Among the most popular was that made by John Carle & Sons, the well-known wholesale druggists of 153 Water St., New York City, of the long-established, standard food for infants and invalids, **Imperial Granum.** Their booth was constantly surrounded by practitioners, who listened with interest to the phonograph, and received souvenir boutonnières and handsome stamp cases.

We have recently been informed by Messrs. John Carle & Sons that a stamp case similar to those given at the meeting, will be forwarded to all readers of our journal sending their professional cards to the above address.

THE Interleaved Edition of "Blakiston's ? Quiz-Compend ? Series" (published by P. Blakiston's Son & Co., Philadelphia) has been reduced in price to $1.00 net. "Blakiston's ? Quiz-Compend ? Series" are full sets of notes on the various branches of medicine. With the Interleaved Edition the student is in a position to note with a minimum of labor any detail of method or treatment of the subject which his teacher may prefer or his quiz-master recommend.

The Battle Creek Sanitarium

LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
NEWTON EVANS, M. S., M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR SEPTEMBER.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
103 per cent.	24	9	33
100 " "	80	92	172
95 " "	13	20	33
93 " "	11	7	18
91 " "			
88 " "	4	6	10
85 " "	5	12	17
83 " "		1	1
78 " "	2	3	5
71 " "	1		1
Below 70 per cent.			
Total	140	150	290

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	50	32	82
Between 4,500,000 and 5,000,000	36	46	82
" 4,000,000 " 4,500,000	29	44	73
" 3,500,000 " 4,000,000	12	21	33
" 3,000,000 " 3,500,000	8	4	12
" 2,500,000 " 3,000,000	2	2	4
Below 2,000,000	3	1	4
Total	140	150	290

Examination of Sputum.— There were 25 examinations made, 19 being new cases. Tubercle bacilli were found in 1 case.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	45	91	24	92	51	69	120	81
Less than 10,000 bac.	1	2	1	4	2	3	4	3
Between 10,000 and 100,000 bac.	2	5	1	4	8	11	11	7
More than 100,000 bac.	1	2			12	17	13	9
Total	49	100	26	100	73	100	148	100

The patients were received from the following States and countries: Michigan, 21; Ohio, 21; Indiana, 19; Illinois, 11; Iowa, 7; Tennessee, 6; Wisconsin, 6; New York, 5; Virginia, 5; Missouri, 5; Minnesota, 4; Kansas, 4; Kentucky, 4; Pennsylvania, 4; Washington, 2; North Dakota, 2; Montana, 2; California, 2; Mississippi, 2; Ontario, 2; unclassified, 2; Connecticut, 1; Texas, 1; Alabama, 1; Oklahoma, 1; Nebraska, 1; Arkansas, 1; Georgia, 1; Louisiana, 1; Wyoming, 1; England, 1; Canada, 2. Total, 148.

Urinary Laboratory.—Total number of specimens examined, 698; number of new cases, 370; number of cases containing albumin, 25; sugar, 8; pus, 116; blood, 3; casts, 3.

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GOOD HEALTH, Battle Creek, Mich.

MODERN MEDICINE

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NEUTRAL AND CONTINUOUS BATHS.

BY J. H. KELLOGG, M. D.,
Superintendent of the Battle Creek (Mich.) Sanitarium.

THE neutral bath is simply a full bath at the temperature of 92° to 97°, administered in the usual manner.

Method.— Friction should not be administered, unless it be very gentle rubbing when the patient first enters the bath, if he feels a slight inclination to chill. Chill will not occur, however, if the temperature of the bath is properly adjusted to the patient's conditions. The average temperature of the bath should be 94° or 95°. When the patient is feverish and the skin hot and flushed, even though there be no rise of temperature, the temperature of the bath may be 92° or 93°. If the patient is thin and bloodless, with small heat-making capacity, the temperature of the bath should be 96° or 97°. All mechanical effects should be avoided after as well as during the bath, as its purpose is to secure calmative or sedative effects. The duration of the bath when applied for relief of insomnia, should be from fifteen minutes to one hour. When used for the reduction of temperature, however, it may be continued for a much longer time, as three to four hours; and in certain cases of acute mania, obstinate insomnia, or fever, it may be continued for several hours consecutively, at a temperature of 92° or 93°. In certain traumatic cases, it may even be continued for weeks or months, the patient being removed only for urination and defecation.

Physiological Effects.—Kuhn, of Niederbronn, first scientifically described the interesting characteristics of the neutral bath. He considered a bath as neutral when of such a temperature that it abstracts from the part immersed exactly the same quantity of heat that the part naturally receives from the blood. The neutral point, according to this authority, is the physiological zero. Below this point water is absorbed; above, it is exhaled. Both the absorption and the exhalation increase in proportion as the temperature of the body varies from the neutral point. This is usually 93° to 94°. This point marks, then, the limit where absorption ceases and exhalation begins. He also noted that fresh water, in determining the more or less rapid imbibition of water by the skin, promotes the cutaneous reaction which plays so important a rôle in hydriatic treatment. The reaction in this case is increased according to the coldness and purity of the water. Cold or cool baths, by introducing cool water into the blood mass, render the blood more aqueous, diminishing its density, and thus acting as a sedative. The purer the water, the more calming are the effects of the bath on account of the greater amount of water absorbed. The neutral point is not fixed. It is solely and entirely regulated by the individual sensation. There is a certain equilibrium between the heat subtracted and the heat produced in normal conditions. It varies a little according to the constitution of individuals, and the disease, and especially with the refrigerating power of the surrounding medium; that is, it is always more elevated when the water is charged with salts than with pure water. In other words, salt-water baths can be taken at a lower temperature than fresh-water baths, since the former stimulate heat production more than do the latter at the same temperature.

The neutral bath diminishes the pulse-rate, but does not modify the respiration. Exhalation by the skin is suspended, so that water accumulates in the tissues. It is in this way that the cutaneous nerves become supersaturated with water, rather than by absorption of water from the bath. At the neutral point there is then prac-

tically no movement of fluids either inward or outward. The urine is greatly increased in quantity, while its acidity is decreased; it may even become alkaline.

The temperature and mode of administration of the neutral bath are such that neither thermic nor circulatory reaction is produced. The bath may consequently be prolonged for an almost indefinite period without producing exhaustion or any other untoward effects. When the bath is prolonged for a considerable period, the patient should be suspended in a sort of hammock consisting of a sheet let down into the tub and secured to the edges, and should be made comfortable by means of an air pillow. The temperature of the neutral bath may be maintained uniform by placing covers over the tub, and adding jugs or bottles filled with hot water as often as may be necessary; or a portion of the water may be removed from time to time, and replaced with water at a higher temperature. When the temperature of the surrounding atmosphere is such as to prevent cooling, so that the bath is warmed by the heat of the body, it may be necessary to add cooler water occasionally to prevent elevation of temperature, whereby the bath would cease to be neutral in its effects. This bath depends for its good effects entirely upon the careful adjustment of the temperature within the limits named, 92° to 97° F.

The physiological effects of this bath are to lessen nerve sensibility, and Kölliker, Hyman, and Krebs have shown that the absorption of water by the nerve filaments accomplishes this. That an anemic or bloodless skin is more sensitive than a congested skin has long been a matter of observation, but it is only recently that the actual demonstration has been afforded by the experiments of the investigators named. The protection afforded the central nervous system against reflex irritation of all sorts by a perfectly neutral medium contributes to the sedative effects of the neutral bath.

The neutral bath is the most purely sedative procedure afforded by the whole range of hydriatic measures. The neutral douche produces very similar results. Its influence is strongly derivative through the circulatory reaction induced by the mechanical effects. The neutral bath excites activity of both the skin and the kidneys to a marked degree.

The neutral full bath, as well as other baths near or above the body temperature, is followed by a decided lowering of the surface temperature. The internal temperature remaining normal, it is evident that there must be a decided reduction in the rate of heat production. The surface temperature sometimes falls as much as six degrees, which would indicate a lessened heat loss amounting to nearly twenty-five per cent and a corresponding decrease of heat production. In the case of the neutral bath, this effect is not due to atonic thermic reaction, as when an application above the temperature of the body is made to the skin, but must result simply from the cutting off of those reflex influences due to contact with the skin of air at a temperature below that of the body, thus annulling one of the important factors in maintaining the activity of the thermogenetic processes in the muscles. This effect of the neutral bath necessitates special care to avoid chilling of the patient by exposure to cold air. The patient should generally recline for an hour after the bath, covered sufficiently to prevent chill, but without overheating.

Therapeutic Applications. — At the quaint and interesting old bathing resort at Leukerbad, Switzerland, which the writer visited in 1883, he found still in use the system of immersion in water at a neutral temperature which has there been employed during several generations in the treatment of a large class of chronic disorders, including skin affections of various kinds. The patients enter the bath about 6 or 7 o'clock in the morning, without breakfast, and remain immersed up to the chin until about 1 P. M.

Riess applied the bath in a large number of cases of organic disease of the brain and cord, including paraplegia, locomotor ataxia, chronic inflammation of both brain and cord, especially in meningitis, in rheumatism deformans, and in various other chronic affections. His success was so great as to give good reason for the belief that this procedure presents valuable therapeutic value in cases of this sort. The writer's experience with the continued neutral bath has been sufficient to convince him of its great value.

It is interesting to note that Currie had a thorough appreciation of the value of the neutral bath, which he employed at 90° to 95°. He recommended it "when the strength is wasted by fatigue and perspiration." He remarked, "In the de-

grees in which it does not quicken the circulation, the warm bath is soothing and sedative, especially when the immersion is prolonged; and it is the temperature from 90° to 95° that is so singularly restorative for fatigue."

The neutral bath, continued for thirty to sixty minutes, or even longer, renders great service in general dropsy, whether due to cardiac or renal disease, especially in cases in which more vigorous measures can not as well be employed. It also renders valuable service in chronic sciatica accompanied by severe pain, as a means of continuing the good effects obtained in the use of other measures; such as, the Scotch douche, the prolonged fomentation, the revulsive compress, massage, electricity, and other well-known means.

In insomnia there is practically no single measure of treatment so valuable as the neutral bath. For this class of patients the bath should be administered at bedtime. The patient often becomes drowsy in the bath, and may fall asleep. He may be allowed to sleep in the bath for several hours if it is found that removal counteracts its hypnotic effect, which is not infrequently the case. The sleeping patient must be carefully watched, however, to see that the head is not submerged.

On removal from the bath, in cases of insomnia, great care should be taken to avoid chilling of the surface by evaporation. The patient should be instantly wrapped in a Turkish sheet and woolen blankets, and should be dried by gentle patting of the sheet or blanket, and without rubbing either with the sheet or with the dry hand, being afterward placed in bed as quickly as possible, and his surroundings made in every way conducive to sleep, so that the good effects of the bath may not be lost by the excitation of the nervous system by unfavorable conditions.

It will be interesting to recall the fact that Hippocrates well appreciated the neutral bath as a means of inducing sleep.

In multiple neuritis, apoplexy, and in the treatment of the alcohol, opium, cocain, and chloral habits, the sedative effects of the neutral bath are of immense service. In cases of this sort it is generally necessary to employ a temperature of 95° to 97°. The influence of the difference of two or three degrees, or even of a single degree, is quite surprising to a person who is not thoroughly acquainted with the singular potency of hydriatic measures when employed with exactness.

Vigoroux recommends the neutral bath for one to three hours for neurasthenics and rheumatics. This author strongly condemns the cold douche in these cases, as he finds the urine of neurasthenics, as of rheumatics, acid, which denotes deficient oxidation, notwithstanding the total amount of the products of excrementitious waste is deficient.

When there is a tendency to heart failure in the use of the warm bath, in cases of cardiac insufficiency, or after the withdrawal of opium or other drugs, this inconvenience may be wholly overcome by the use of the ice-bag over the heart during the bath. An application to the head and neck is also necessary in cases of this sort when a temperature approximating that of the body is employed. The value of the neutral bath in the affections mentioned is largely due to its action upon the kidneys, the activity of which it encourages to a high degree, while at the same time it quiets the irritated brain and cord. This purification of the blood through increased renal and cutaneous activity improves general vital action, and gives this bath decided restorative as well as sedative effects.

The neutral bath is of great value in chronic diarrhea, peritonitis, and other chronic affections of the abdomen, and especially those in which the patient is in a condition to interdict the employment of very hot or very cold baths. In such cases it may be employed daily for fifteen to thirty minutes. It is also of value in cases of toxemia, which is so commonly present in chronic dyspepsia, and in pruritus without eruption, either with or without jaundice, also in the several forms of urticaria.

The neutral bath is often employed in connection with electricity. The writer has for more than twenty years made extensive use of this bath as a means of making general applications of the galvanic, faradic, and sinusoidal currents.

The neutral bath may be employed as an antipyretic and antifebrile measure in continued fevers, and is especially serviceable for infants, old persons, and others with a feeble constitution, or in cases which have been neglected in the

early stages until the patient has reached so low a state that the cold bath is interdicted because the nerve centers have not enough vitality left to react to so heroic a measure. When employed for this purpose, the temperature of the bath at the beginning should be 98°, and should be rapidly lowered to 92° or even 90°, when it should be prolonged for half an hour or two hours. The length of the bath should be not more than ten minutes for very aged persons, and five to ten minutes for infants, but should be repeated every two hours, or whenever the temperature reaches 100° to 102°.

The neutral bath is especially indicated in disorders of the nervous system and of the heart and blood vessels. Arteriosclerosis gives rise to deterioration in the central nervous system as well as elsewhere. From deficient flushing of the parts with healthy blood, tissue deterioration begins; and the disorder is then rapidly intensified by the accumulation of tissue poisons in the part, and degeneration of the blood vessels takes place with great rapidity. Long-continued contraction of the blood vessels gives rise to a disturbance in the nutrition of their walls, which finally results in relaxation and paralysis, and the local disorder becomes fixed.

Either very cold or very hot applications must be avoided in cases of chronic disease of the central nervous system, because of the diseased condition of the vessels, which are overworked, and liable to rupture under the strain of the inrush of blood in the general retrostasis accompanying applications to the whole surface, and in the collateral hyperemia resulting from very cold applications to the back. As a rule, a temperature below 70° or above 110° is not useful in the treatment of organic nervous disorders. Partial cold friction may be employed in these cases, but general applications should be at temperatures not far removed from the body temperature, or 85° to 104°.

Contraindications.—About the only contraindication for the neutral bath is the presence of some morbid condition to which the application of water may be inappropriate or injurious. In certain cases of eczema and some other forms of skin disease, water aggravates the symptoms. Also in great cardiac weakness and in certain cases of neurasthenia the neutral bath is depressing, and must be avoided, or at least employed with exceeding care and caution, and accompanied by supplementary procedures, such as cold friction, the wet-sheet rub, and the cold precordial compress over the heart.

THE CONTINUOUS BATH.

The continuous bath is simply a neutral bath prolonged for many hours, days, weeks, or months, as the case may require.

Method.— A suitable bath tub must be provided, and should be placed in a well-ventilated and convenient apartment with suitable arrangements for changing the water as may be required for cleanliness and regulation of the temperature. The ordinary bath tub, without accessories, will not answer the purpose, for the reason that the patient soon becomes weary with the effort to support himself, or is inconvenienced by the pressure of his tissues against the hard metal or porcelain surface of the tub. The arrangement should be such that the patient may be as fully as possible at ease. This requires that he should be suspended by some arrangement resembling a hammock. A closely woven hammock, covered with a blanket, may be used for the purpose, or a strong linen sheet may be employed. The hammock may be suspended from hooks attached to the walls of the room, being allowed to sag into the bath tub sufficiently to submerge the patient. The sheet may be supported in proper position by means of a frame with pegs or holes properly adjusted to the top of the tub. By means of strong tapes attached to the sheet, it may be fastened to the frame in such a way as to maintain the patient's body in the most comfortable and restful position.

In emergency, and while better arrangements are being perfected, the patient may be made comparatively comfortable by means of one or more blankets folded and placed in the bottom of an ordinary bath tub, or better still, by means of air pillows filled with water of the same temperature as the bath, or several large water bags placed in the bottom of the tub so as to support the hips, shoulders, and heels. Pillow cases filled with excelsior, such as is used for mattresses, or curled hair, may be employed in the same way. The head should be prop-

erly supported, and care should be taken that the shoulders are constantly covered with water to prevent chilling by evaporation and the consequent pulmonary congestion which is almost certain to result from prolonged cooling of these important reflex areas.

The temperature of the water should be 94° to 95°, the average neutral temperature. On first entering the bath, the patient must be very gently rubbed for one or two minutes, to prevent the preliminary contraction of the cutaneous vessels which sometimes occasions at first a slight disturbance of the general circulation. The temperature of the bath may be maintained by dipping out a portion of the water from time to time, and adding either hot or cold water, as may be required to bring the temperature to the neutral point. By covering the bath, cooling by evaporation may be prevented, and the necessary reduction in temperature may be readily effected by putting into the bath bottles or jugs filled with ice water. A jug containing three quarts of ice water will lower the temperature of a forty-gallon bath one degree.

The duration of the bath will differ according to the character of the case. When employed for temperature reduction or to control delirium, pain, peripheral hyperesthesia, nervous excitability, or mania, a few hours (at most ten or twelve hours) will usually suffice to accomplish the result desired. In continued fevers, and in organic affections of the brain and spinal cord, for which the bath may be employed, it is sufficient in most cases to keep the patient in the bath during the greater part of the day, allowing him to rest in bed at night. But in case of extensive burns, bedsores, and certain forms of skin disease, it is often necessary to make the bath absolutely continuous, removing the patient only long enough at proper intervals to allow opportunity for evacuation of the bowels and the bladder. In a few instances, the bath has been continued for an entire year, and even longer. There is no reason why life might not be prolonged indefinitely in this bath so far as the normal performance of all the vital functions of the body is concerned, as the bath interferes with no vital process. The water of the bath should be entirely changed every twenty-four hours.

Physiological Effects.—Riess, who made a careful study of this bath in the city hospital of Berlin, in the years 1874 to 1876, maintained that the physiological effects of the bath are negative, affecting neither pulse, temperature, nor respiration. More recent observations have, however, shown that the pulse is slowed by the bath, and that other bodily functions are affected, if not profoundly, at least to a noticeable and important extent. As in the neutral bath, the cutaneous nerves imbibe moisture, not through the absorption of water from the bath, but by retention of water through the suspension of perspiration. The urine is noticeably increased in quantity, and becomes less acid or even alkaline. The higher the temperature of the bath, the greater the alkalinity, as shown by Jardet. At the neutral temperature there is practically no absorption of water nor of substances contained in the water. There is only suspended perspiration.

Therapeutic Applications.—Hebra was one of the first among scientifically trained physicians to make use of the continuous bath. When studying skin diseases in Vienna with Hebra, Jr., and Professor Kaposi, Hebra's successor, in 1883, the writer found the continuous bath in systematic use. One patient then in the hospital had been in the bath more than a year. Hebra reported five hundred cases, — of variola, pemphigus, burns, and gangrene of the skin,— and showed that most excellent results were obtainable by this therapeutic procedure.

Passavant, of Frankfort, reports most gratifying success in the treatment of extensive burns with the continuous bath. According to his experience, pain is almost instantly relieved by immersion in the neutral bath, the patient remaining comfortable so long as submerged.

Riess, of Berlin, made a special study of the influence of the continuous bath upon internal maladies of various sorts, as well as in the treatment of typhoid and other fevers. In the treatment of over eight hundred cases of typhoid fever he secured a death-rate of 8.5, a much better record than that shown by the statistics of any other hospital in the city. He employed a temperature of 88° in fever cases, and administered the bath whenever the temperature rose to 102°, keeping the patient in the bath continuously until the temperature was brought down to 100°, and returning him to the bath as soon as the

original temperature was reached. The continuous tepid bath presents the following advantages over the cold bath, as shown by Riess, together with some possible disadvantages: —

1. It is less disagreeable to the patient; indeed, it occasions him no inconvenience, and is generally welcomed, while the cold bath is received only under vigorous protest.

2. It involves no risk of injury to the heart in cardiac weakness, nor to the brain in arteriosclerosis, and can be used in many cases in which the cold bath must be interdicted.

3. It affords more prompt relief to cerebral and nervous symptoms, these features, when present, disappearing almost altogether with the first bath.

4. Cyanosis and other evidences of disturbance of the circulation do not occur.

5. The temperature is reduced slowly, hence temperature reduction is more permanent, there being no increased heat production by thermic reaction.

6. The duration of the disease is decidedly shortened, the average stay in the hospital, with Riess's eight hundred cases, being less than eighteen days.

7. All the symptoms of the disease are mitigated to a marked degree.

8. The labor of caring for the patient is greatly lessened, which is a boon to the patient as well as to the attendant.

It is true that the continued bath does not afford that degree of cardiac stimulation or excitation of vital resistance which is developed by the cold bath; but this is largely compensated for by the increased activity of the kidneys and skin which is secured by the continuous bath, a fact of primary importance, since the symptoms of cardiac weakness which are often so pronounced in continued fevers, are to be properly attributed not so much to actual exhaustion of the heart as to the profoundly depressing effects of the toxins characteristic of the special malady present and the retention of tissue wastes resulting from diminished oxidation. When desired, however, any required degree of cardiac or general vital stimulation may be secured by the occasional application of the Brand bath, when not contraindicated, or by cold friction, the cold-towel rub, or the cold wet rubbing sheet in bed.

The large clinical experience of Riess showed that the continuous bath possesses powerful curative virtues in all affections of the brain and the spinal cord which are at all curable, as in cases of exudate from inflammations, as in meningitis, and mitigates the symptoms to a wonderful degree even in the most intractable and incurable cases. The measure proved decidedly beneficial in cases of spinal sclerosis, locomotor ataxia, paraplegia, hemiplegia, apoplexy, and chorea. It was found equally helpful in the treatment of intractable sciatica and cutaneous hyperesthesias, affecting a cure in cases which had resisted all other measures. In delirium and mania, it exercised a phenomenal sedative effect, was highly beneficial in dropsy and in chronic diarrhea, and afforded excellent results in chronic rheumatism. No remedy has been found more useful in bedsores. Its results in other functional nervous disorders suggest its possible value in epilepsy.

Dauchez reports complete relief from hysteria with extremely grave gastric symptoms. The patient was immediately relieved by the tepid bath in four to eight hours, and in three weeks was well.

The principal patrons of Leukerbad, Switzerland, where the neutral bath is administered to many scores of persons in great tanks for several hours a day, are irritable neurasthenics, rheumatics, and persons suffering from psoriasis and eczema. That many are cured is evident from the fact that these famous old baths still retain their popularity, notwithstanding their comparative inaccessibility, and the powerful competition of the more fashionable resorts in Germany and Bohemia. When the writer visited these baths, some seventeen years ago, although the season had yet scarcely opened, multitudes were already flocking there, to avail themselves of what they supposed to be the specific virtues of the mineral ingredients of the bath, by which, however, they were not at all likely to be benefited, since at the temperature at which the baths are given (95° to 98°), the movement of fluids is toward the surface of the body, so that absorption can not take place to any appreciable degree.

Hebra employed the continuous neutral bath for many days, and even months, in hundreds of cases of skin diseases, especially in pemphigus and extensive burns. When the continuous neutral bath is to be employed, the precaution should be taken to rub the skin with vaseline at

least once a day, to avoid unpleasant effects from the prolonged maceration of the skin in the water.

In employing the continuous bath, care should be taken to apply oil or vaseline to the surface of the body to avoid excessive maceration of the skin.

The continuous bath is certainly a hydriatic procedure of great value, and one worthy of more attention than it has received from the profession in this country.

Early Symptoms of Tuberculosis.—Bozzolo (*Lancet*) calls attention to the following signs which point toward the existence of tuberculosis in its earliest stages: (1) Albuminuria alternating with phosphaturia; (2) a pseudo-chlorosis distinguishable from true chlorosis by the slighter degree of reduction of the hemoglobin and by the less marked vascular and cardiac disturbances—palpitation, soft pulse, pulsating arteries, etc.; (3) the presence of gastric disturbances like gastralgia, anorexia, nausea, and vomiting; (4) tachycardia in absence of fever; (5) diminution of blood pressure; (6) a rise of temperature following bodily or mental exertion above the slight rise proper to health; in women a rise of from 0.3° to 0.4°C. is observable before the onset of each menstrual period; (7) an undue tendency to sweat after exertion, mental or bodily, also night sweats; (8) pain in the supra orbital regions and in the neck; (9) a slight inequality of the pupils, with a tendency to dilatation; (10) the occurrence of herpes zoster; (11) enlargement of the spleen. The first seven symptoms mentioned are most frequently found, and are of the greatest diagnostic value.

The Treatment of Perforation of the Bowel from Typhoid Fever.—W. W. Keen (*Jour. Am. Med. Assoc.*, Jan. 20, 1900), in a record of 158 cases, tabulates his views on the operative treatment of typhoid perforation as follows:—

1. The surgeon should be called in consultation the moment that any abdominal symptoms indicative of possible perforation are observed.

2. If it is possible to determine the existence of the perforative stage, exploratory operation should be done under cocain anesthesia before perforation, shock, and sepsis have occurred.

3. After perforation has occurred, operation should be done at the earliest possible moment, provided,—

4. That we wait till the primary shock, if any is present, has subsided.

5. In a case of suspected but doubtful perforation, a small exploratory opening should be made under cocain to determine the existence of a perforation, and if hospital facilities for a blood count and for immediate bacteriological observation exist, their aid should be invoked.

6. The operation should be done quickly but thoroughly, and in accordance with the technique already indicated.

7. The profession at large must be aroused to the possibility of a cure in nearly, if not quite, one third of the cases of perforation, provided speedy surgical aid is invoked.

Don'ts in Heart Disease.— Don't feel called upon to give digitalis as soon as you hear a murmur over the heart. Study and treat the patient, not the murmur.

Don't conclude that every murmur means disease of the heart.

Don't forget that the pulse and general appearance of the patient often tell more than auscultation.

Don't neglect to note the character of the pulse when you feel it. Possibly you may look at the tongue to satisfy the patient; feel the pulse to instruct yourself.

Don't think that every systolic murmur at the apex indicates mitral regurgitation; every systolic murmur at the aortic interspace, aortic stenosis. The former may be trivial; the latter may be due to atheroma of the arch of the aorta.

Don't say that every sudden death is due to heart disease.

Don't forget that the most serious disease of the heart may occasion no murmur. A bad muscle is worse than a leaky valve.

Don't examine the heart through heavy clothing.

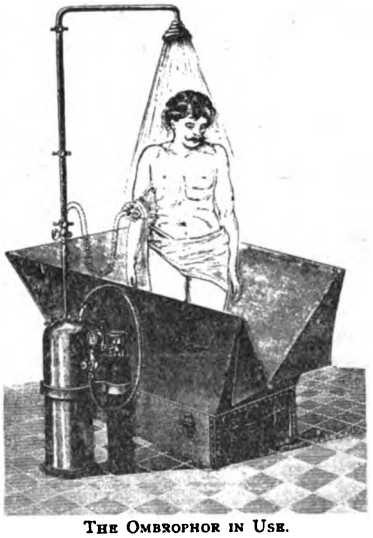
Don't give positive opinions after one examination.— *Philadelphia Medical Journal.*

TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

THE OMBROPHOR.[1]

WINTERNITZ and Gärtner (*Blätter für klinische Hydrotherapie und verwandte Heilmethoden*, Nos. 4 and 5, 1900) state that there is nothing so capable of contributing to the spread of the use of water as a dietetic, hygienic, prophylactic, and therapeutic measure as the possibility of utilizing this agent in the home, independently of trained attendants, of water-pipe system and special bath-rooms. This consideration and the fact that the douche and bathing contrivances are not easily transportable, and that those which are transportable usually work with too low pressure, which can not be regulated, induced one of these men a number of years ago to make a crude apparatus which was quite extensively used by his patients. They have since succeeded in constructing an easily transportable apparatus which can be set up and used in any room almost without attendants, and from which the force of the stream, the temperature, and the chemical constituents can be unchangeably regulated. They use as the source of the necessary pressure a bottle of liquid carbonic acid.



THE OMBROPHOR IN USE.

The apparatus, which when folded represents a heavy trunk of twenty kilograms, with handles for transporting, after the cover is removed, shows a box into which the whole contrivance is packed. The trunk may be transformed in a simple manner, as herewith illustrated. The box may be lifted out and the separate parts adjusted, waterproof screens set up in a small bath tub lined with thin zinc plates, the narrower side of which is provided with a slit and lock, through which the patient may enter the bath.

The whole apparatus consists of a copper and nickel waterkettle with a capacity of about ten liters. This kettle has on its upper convex surface an opening through which it may be filled with water of the desired temperature by means of a funnel or rubber tubing, then covered by an air- and water-proof cloth.

Beside the waterkettle and joined to it by a metal rod is a steel flask containing one kilogram of fluid carbonic acid. This flask is supplied with a reducible valve and a steam gauge. The valve is joined to a second opening of the water cylinder by a metal spiral tube; from this opening, through which the carbonic acid streams into the water cylinder, a pipe runs into the water vessel, where it ends in a coil at the base; this part of the pipe is punctured with a large number of capillary holes.

To the third opening in the middle of the water cylinder another pipe is fastened, running through the vessel to the base, with which are connected, through stopcock pipes, capable of being shut off from the ascending pipe, the spray head and the side sprays by means of so-called Holland "lock precis."

The apparatus thus put together is set near the box bath-tub, so that the spray stands above the middle of the tub. The wheel valve of the carbonic-acid flask is now opened and the pressure regulated by the ideal valve of the steam gauge. The carbonic acid is forced into the water cylinder in a sufficient quantity to induce the pressure required, and the bath is ready for use. The patient enters through the slit, closes and buttons it, opens the stopcock of the spray, and takes a general douche, or shuts off the rain from above and with the movable side spray uses the douche to every part required. The water which accumulates in the tub after the bath, is easily let off by a valve fastened near the bottom.

The flask containing one kilogram of liquid carbonic acid may be used for twenty to twenty-five douches, and may be replenished for fifty *kreutzer* (about twelve cents) in almost any carbonic-acid factory in large cities.

[1] A transportable apparatus for rain baths with carbonic-acid water.

The effect of this bath is not alone mechanical and thermal, but the fine pustules of CO_2 which press through the openings of the coil cling to the skin and cause a chemical irritation which produces a peculiar, pleasant prickling, lessening the sensibility of the peripheral nerve endings to the low temperature of the water, and thus making the reaction easier and of longer duration. The efficacy of the rain bath or douche for well persons, as well as weakened and convalescing patients, the anemic, and those suffering from circulatory disorders, has been confirmed by many years of experience, and this apparatus, which enables the traveler, as well as those in ordinary houses, to enjoy the moving shower, certainly shows marked hygienic progress.

Stable apparatuses on the same principle are being prepared. The carbonic-acid factory of Dr. Raydt, Vienna, has undertaken the manufacture of the apparatus.

SOME USEFUL FORMULÆ.

For Chapped Hands and Face.—

℞

Quince seed	2 oz.
Alcohol	15 oz.
Glycerin	6 oz.
Boroglyceride	6 oz.
Water qs	1 gal.

Extract violet qs to give it an odor.

Macerate quince seed in a half gallon of water for twelve hours, strain, and add the rest of the ingredients and enough water to make a gallon.

Antiseptic Lotion.—

℞

Baptisia	15 gr.
Acid benzoic	250 gr.
Acid boracic	300 gr.
Thymol	40 gr.
Menthol	140 gr.
Oil eucalyptus	20 M.
Oil wintergreen	75 M.
Oil cassia	100 M.
Alcohol	14 pt.
Water qs	5 gal.

Macerate the oils, acids, and baptisia in the alcohol for one-half hour, then add the water. Lastly filter. For external use.

Lubricant for Instruments.—

℞

Glycerin	15 oz.
Pulv. starch	½ oz.
" gum tragacanth	½ oz.
" boracic acid	1½ oz.
Oil wintergreen	¼ oz.

Rub the starch and tragacanth in a mortar with the glycerin, add powdered boracic acid, and boil on a glycerin bath until it becomes clear. After cooling, add oil of wintergreen. Strain while yet warm, and put in a collapsible tube.

Toothache Remedy.—

℞

Cocain	20 gr.
Tr. aconite	1 dr.
Oil cloves	1 dr.
Creosote	2 dr.
Chloroform	3 dr.
Carbolic acid	1 dr.
Tr. opii	1 oz.
Spt. camphor	3 oz.

Cold Cream.—

℞

Sweet almond oil	5 lbs.
White wax	1 lb.
Spermaceti	1 lb.

Melt over a gentle fire until the wax is dissolved, stir until it becomes the consistency of cream, then add slowly one pint of hot saturated solution of borax; continue to stir until the cream becomes stiff.

Sulphur Dressing.—

℞

Flour sulphur	4 lbs.
Bis. sub. nit.	12 oz.
Essence cinnamon	10 dr.

Triturate the ingredients thoroughly. The sulphur should be sterilized thoroughly by boiling in a bag before mixing.

Acne Lotion.—

℞

Hyd. chlor. corros.	64 gr.
Ether	2 oz. 6 dr.
Alcohol	8 oz.
Rose water qs	2 pt.

M.

Sig. Apply twice a day with equal part of hot water.

For Dandruff.—

℞

Resorcin	10 gm.
Castor oil	48 gm.
Alcohol	150 gm.
Balsam Peru	5 gm.

Bismuth Mixture.—

℞

Bis. subcarb. ..... 4 oz.
Water ..... 1 qt.
Bicarb. soda ..... 1 oz.

Mix bismuth and soda in the water, shake occasionally during twelve hours, carefully decant the water, refill the bottle with fresh water, and decant the second time, and repeat, if necessary, until all trace of soda is removed. Lastly fill the bottle with distilled water.

Bismuth and Coto Mixture.—

℞

Bism. mixt. ..... 3 oz.
Fld. ex. coto ..... 2 dr.
M.

Sig. Teaspoonful every two or three hours, for diarrhea.

Turpentine Soap.—

℞

Spt. turpentine ..... ½ pt.
Brown soap ..... 1 lb.
Water qs ..... 1 gal.

Boil the soap in water until dissolved, then add the turpentine.

Eczema Ointment.—

℞

Zinc ox. ..... 2 dr.
Starch ..... 2 dr.
Salicylic ..... 20 gr.
Oil tar ..... 5 M.
Vaselin qs ..... 2 oz.
M.

Sig. Apply twice a day.

Deodorized Iodoform.—

℞

Iodoform ..... 2 lb.
Powdered boracic acid ..... 2 lb.
Tr. benz. comp. ..... 4 oz.

Triturate thoroughly in a mortar.

Astringent Preparation.—

℞

Acid tannic ..... 1 dr.
Glycerin ..... 1 oz.

Heat together until the tannin is dissolved.

For Psoriasis.—

℞

Acid chrysophanic ..... 5 gr.
Acid salicylic ..... 10 gr.
Ung. aqua rosa ..... 1 oz.
M.

Sig. Apply every night.

For Hives.—

℞

10% sol. carbolic acid ..... 4 oz.

Apply externally.

Menthol Liniment.—

℞

Menthol ..... 1 oz.
Alcohol ..... 1 pt.
Red analine qs to color

For compress, dilute one-half with water.

Lanolin Cream.—

℞

Lanolin ..... ½ oz.
Cold cream ..... 1½ oz.
Rose water ..... 1 oz.

Mix thoroughly.

The Increasing Prevalence of Cancer as Shown in the Mortality Statistics of American Cities.— G. Betton Massey, M. D. (*Am. Jour. Med. Sc.*, February, 1900), in a paper on this important subject, states that after many years' inattention to the subject, the medical profession has recently awakened to the fact that mortality statistics show a rapid increase in the prevalence of cancerous affections during the last thirty or forty years. According to several writers, this increase has not occurred in the less civilized countries of the world, though it is evident that exact information on this question is necessarily lacking, and particularly so when we remember that the collection of vital statistics is a governmental duty liable to be discharged by civilized countries in a manner closely in unison with their position in the scale of civilization, and that those collected by many countries ranking high in the scale of civilization leave much to be desired in accuracy and fullness.

It is, nevertheless, the opinion of competent observers that cancerous affections are *not common among barbarous peoples.* Herbert Snow, of the Brompton Cancer Hospital, in London, states in a recent work that Davidson's "Geographical Pathology," published in 1893, while showing the prevalence of cancer in Europe and the United States, affirms its rarity or *entire* absence in Arabia, East Central Africa, Bechuanaland, Färöe Islands, Gold Coast, Guiana, Iceland, Jamaica, Mauritius, New Caledonia, and Persia,

with a conflict of testimony with respect to Abyssinia.

Concerning the prevalence and increase of these affections in the most highly civilized countries, the testimony is exact and most startling. The figures given by the Registrar-general's report for England and Wales during thirty-one years, shows that there has been an increase from 38.5 persons dying from cancer in 100,000 living poulation in 1864 to 75.5 dying from cancer in 100,000 living in 1895; in other words, the ratio of mortality from cancer has almost exactly doubled in England and Wales during the thirty-one years preceding 1895; Snow states that the deaths from cancer in Ireland in 1864 were 1,498, with a population of 5,678,307. In 1884, with a decrease of population to 4,962,693, an increased mortality from cancer of 1,947 is recorded. In Scotland the population in 1864 was 3,118,701, with 1,300 victims of cancer; in 1884 the population was slightly increased, and the cancer mortality was 2,110.

The condition of affairs is probably becoming quite as bad in America, and in a recent paper, Roswell Park makes the prediction that if the present rate of increase of cancer in New York State continues during the next ten years, its mortality will become greater than that of consumption, typhoid fever, and smallpox combined.

The greatest increase has occurred in the city of San Francisco, where the ratio has crept up from 16.5 cases in 100,000 population in 1866, to 103.6 cases in 100,000 in 1898. This enormous increase of more than six times as many cases in thirty-two years, is deserving of special attention by the people of that city.

The city of Boston shows the next most considerable increase, the ratio of cases to living persons having almost trebled in the twenty-four years between 1863 and 1887. After the latter date there was a temporary decrease, followed by a tendency to increase to the present time.

In the seven largest American cities, exclusive of Chicago, with a combined population in 1870 of 8,207,464, there were 999 deaths from cancer, or 35.4 deaths per 100,000 living persons. In 1898 the population of the same cities, inclusive of Brooklyn, now a portion of New York, was 7,035,235, and there were 4,273 deaths from cancer, or 66.4 deaths per 100,000 living persons, showing that the ratio of cancer deaths to the living inhabitants of these cities had almost doubled in the comparatively short time of twenty-eight years.

The writer believes that if the same ratio of increase is maintained until 1910, there will be an average of eighty deaths in each city in that year to every 100,000 living persons.

Some Notes on the Use of Mercurol, a New Remedy in Urethritis. — Ramon Guiteras, M. D. (the *Lancet*), London, England, Sept. 22, 1900, states that he has thoroughly tried Mercurol in his clinic, and from his experience has drawn certain conclusions which he presents in this paper. After describing the chemical nature of Mercurol, he states that he found the weaker solutions had little effect and the stronger solutions were at first irritating. He finally concluded that the average strength best borne by the patient is ten grains to the ounce, or approximately two per cent. After having reached this conclusion, he had the histories of one hundred cases recorded, in thirty-three of which an examination for the gonococcus was made, revealing its presence in thirty cases. In the remaining sixty-seven cases a clinical diagnosis was depended upon, since the writer considers the experienced eye competent to recognize the disease. In one extremely interesting case no gonococcus could be found in the urethral discharge, although gonococci were present in that of some venereal ulcers on the glans.

In these cases a two-per-cent solution of Mercurol was ordered, which the patients were directed to inject three times a day, after micturition, the injection to be held within the urethra for five minutes at each operation. The clinical reports of the cases show that frequently in two days after beginning the use of Mercurol, gonococci could no longer be found in the discharge.

The writer discusses at some length the value of the term "practically cured," and sums up his argument by saying that to draw conclusions of value we should consider only cases that have been under treatment for three or more weeks, omitting those making but a few visits. On this basis he eliminates all but sixty-five cases from his report, and tabulates these as follows:—

Ten cases were cured in four weeks, or fifteen per cent; fifteen cases were cured in six weeks, or twenty-three per cent; twenty cases were practically cured, as there was no discharge, though there were some shreds in the urine at the end of from four to eight weeks, thirty per cent.

One of the most valuable observations that the writer has made is the fact that *only two cases suffered from complications*, one having developed gonorrheal rheumatism and the other epididymitis. He states that this fact in itself would tend to argue much in favor of the use of Mercurol, for where is there any other solution or mixture which does not show a greater percentage of complications? When we consider that many writers claim that epididymitis occurs in twenty per cent of all cases of urethritis, the rate of one per cent reported in this series of cases argues much in favor of Mercurol as a harmless, yet efficient injection.

Another interesting feature is that in only one of the one hundred cases was there any marked posterior urethritis. Therefore it would seem that *Mercurol quickly destroys the gonococcus, lessens the severity of the inflammation, and tends to prevent the development of complications.* From a comparative study of the different methods of treating gonorrhea, the writer concludes that treatment with Mercurol is in advance of the older methods with balsamics and astringent injections.

Wholesome Advice Concerning the Preservation of the Teeth of School Children.— The following rules are recommended by the School Children's Committee of the British Dental Association, and circulated for the information of managers and teachers of national schools in Ireland (*Journal of the British Dental Association*): —

"Without good teeth there can not be good mastication.

"Without thorough mastication there can not be perfect digestion, and poor health results.

"Hence the paramount importance of sound teeth.

"Clean teeth do not decay. The importance of a sound first set of teeth is as great to the child as a sound second set is to the adult.

"Children should be taught to use the toothbrush early.

"Food left on the teeth ferments, and the acid formed, produces decay.

"Decay leads in time to pain and the total destruction of the tooth.

"The substance of the following rules should therefore be impressed constantly upon all children: —

"1. The teeth should be cleansed at least once daily.

"2. The best time to clean the teeth is after the last meal.

"3. A small toothbrush, with stiff bristles, should be used, brushing up and down and across, and inside and outside, and in between the teeth.

"4. A simple tooth powder, or a little soap and some precipitated chalk taken up on the brush may be used if the teeth are dirty or stained.

"5. It is a good practice to rinse the mouth after every meal.

"6. All rough usage of the teeth, such as cracking nuts, biting thread, should be avoided, but the proper use of the teeth in chewing is good for them.

"When decay occurs, it should be attended to long before any pain results. It is the stopping of a small cavity that is of the greatest service.

"In 10,000 children's mouths examined, 86 in every 100 required skilled operative treatment."— *Medical Review of Reviews.*

Recent Methods in Cardiac Therapeutics by Baths and Exercises.— Satterthwaite (*Medical News*, March 10, 1900) says that the exercises are chiefly voluntary, and consist in flexion, extension, adduction, abduction, and rotation of the limbs, neck, and trunk by the patient, while the operator opposes graduated resistance. Passive respiratory movements are also used. The exercises should be at first short, and gradually increase in length and force. The patient should at the same time take exercise in the open air, but avoid physical or mental strain and overeating. For a six-weeks' course the baths are given as follows: First week, half per cent salt bath at 98° F., duration four minutes. Second week, three-fourths per cent salt and one-fourth per cent carbonic acid gas, temperature 97° F., duration six minutes. This strength is gradually in-

creased until on the sixth week the bath is two per cent salt and one per cent carbonic acid gas at 93° F. for fourteen minutes. Baths and exercises are omitted every third or fifth day. The exercises and baths improve the superficial and deep circulation, the blood is invited to the skin and limbs, preventing congestion of the internal organs, relieving the heart of the internal pressure, and giving an opportunity to contract. The muscular movements act by emptying the lymphatics and veins, diminishing peripheral resistance. The effect of the baths is due to the warm brine and to the anesthetic and stimulant effect of the carbonic acid gas and calcium chloride. The baths slow and strengthen the heart, and also increase renal secretion with disappearance of exudations. Rheumatism, gout, chlorosis, typhoid fever, and some functional and organic nervous disorders are improved by this treatment. It should not be used in Bright's disease where there is serious involvement of the parenchyma of the kidney; in Graves' disease with dilatation, in extensive cardiac dropsy, and in advanced stages of phthisis the treatment is of no value. During the course, heart tonics and stimulants should be used only as a last resort, the object being rather to remove obstacles to the circulation than to compel a weak heart to forceful contractions.— *Medical Fortnightly, Oct. 25, 1900.*

Is Alcohol a Food or a Poison?— Kassowitz (*Medical Record*) maintains that it is not so much a question as to whether alcohol *per se* is toxic or nutritive, for it can hardly be denied that it is an active poison capable of causing the death of any animal or vegetable protoplasm with which it comes in contact, but rather as to whether in spite of these injurious properties it can still be of value to the organism and serve to sustain it. A food stuff, to be classed as such, must not only be capable of supplying the organism with energy to be dissipated as heat and in the performance of work, but must also, under proper conditions, enter into the bodily structure and replace tissue that has become worn out. Recent investigation has shown clearly enough that alcohol is easily and abundantly oxidizable in the human body, but the mere proof that a substance is consumed in this way does not entitle it to rank as a food, and still less can this supposition be entertained if, in addition, it at the same time causes decomposition and destruction of living protoplasm. That alcohol does this is to be doubted in view of the present knowledge of metabolic processes, and this granted, it is evident that a substance capable of destroying body tissue can not also at the same time serve to build it up and replace damaged parts. Therefore the position that alcohol may play the double rôle of food and poison is untenable, and the sooner it is dropped from the list of drugs for internal administration the better it will be for physician and patient.— *Quarterly Journal of Inebriety, October, 1900.*

The Transmission of Tuberculosis by Human Milk.— The *Revista de medecina y chirurgia Prácticas* for July 21, citing *Progrés Médical,* says that Dr. Roger and Dr. Garnier recently reported to the Paris Society of Biology the following facts: They found the bacillus of tuberculosis in the milk of a woman who died from miliary tuberculosis seventeen days after childbirth, without the existence of any tuberculous lesions in the mammary glands. This milk was taken with aseptic precautions and inoculated into two small Indian rabbits. The first, which had received subcutaneously four cubic centimeters, succumbed after thirty-three days, with generalized typical tuberculous lesions; the second, into which only two cubic centimeters were injected, did not die, and when it was killed, ten months later, only simple non-tuberculous cicatrices were found. The infant died after six months, with tubercle in the mesenteric glands, the liver, spleen, and kidneys. From these facts it appears that the intestine formed the point of entrance. This case, the writers think, shows that the milk from a tuberculous woman may contain the bacillus of Koch and transmit tuberculosis.— *N. Y. Medical Journal, Sept. 1, 1900.*

Causes of Death.— A leading life insurance company has recently published its monthly records, covering a period of fifty years. Notwithstanding the utmost care is observed in securing only good risks, free from organic diseases, the

cause of death in the insured and uninsured is probably much alike. Out of 44,963 deaths, a trifle over one eighth (5,585) were from tuberculosis. Almost the same number (5,542) came from apoplexy, softening of the brain, and paralysis, which are kindred maladies, if not practically identical. To disorders of the heart are credited 4,839 deaths (one ninth); to the digestive apparatus, 4,584 (over a tenth); pneumonia, 4,062 (an eleventh); violent causes, 3,337; Bright's disease, 2,997; typhoid fever, 1,712; nervous diseases, not specified, 2,306; ill-defined and obscure cases, 1,768; and other recognized maladies, 5,450.

When the deaths from the causes just enumerated are divided into three periods, the age of forty-five and under, from forty-five to sixty, and above sixty, some striking facts are brought out. Among the insured, fifty per cent of the deaths from violence (accident or intentional assault), fifty-nine per cent of those from tuberculosis, and sixty-eight per cent of the total typhoid cases, occur in the first period. On the other hand, forty-seven per cent of the mortality from Bright's disease, fifty-five per cent from apoplexy and paralysis, and fifty-six per cent from heart disease occur after sixty. Mischief from the digestive apparatus is fairly well distributed, thirty per cent of the deaths occurring in the first period, thirty-eight per cent in the second, and thirty-two per cent in the third.— *Medical Times, October, 1900.*

Internal Organs Which May Be Influenced Reflexly by Applications to Definite Areas of Skin.— The *brain* by application to the head, neck, face, hands, and feet.

The *nasal mucous membrane*, by applications to the neck, face, upper dorsal spine, hands, and feet.

The *stomach*, by applications to the lower dorsal spine and the epigastrium.

The *kidneys*, by applications to the lumbar region, the lower portion of the sternum, and the feet.

The *bowels*, by applications to the feet and the abdomen.

The *bladder*, by applications to the feet and lower abdomen.

The *liver*, by applications to the lower right chest.

The *spleen*, by applications to the lower left chest.

The *lungs*, by applications to the chest and the thighs and to the upper dorsal region.

The *uterus*, by applications to the lumbar region, the abdomen, the breasts, the inner surfaces of the thighs, the feet, and to the cervix uteri through the vagina.

Therapeutic Use of Dry Heat.— Hugo Davidson, of Berlin (*Berliner klinische Wochenschrift*, Jan. 29, 1900), describes an ingenious apparatus for the continued application of dry heat. It consists of rubber tubing similar to that used for the well-known Leiter pipes, sewed to a rubber cloth at distances of ca. 1–2 cm. to make a pillow of the required size; the pillow is laid upon a layer of fango, and covered by a layer of asbestos. It is adjustable to the shape of the body, and is kept at an even temperature of the required degree by a stream of hot water running through the tubing. He has also constructed a mattress of the tubing and so arranged its coils that either the lower or upper extremity may be heated separately. The tubing is not compressed by the weight of the patient sufficiently to stop the flow of the water, and affords an extraordinarily soft and comfortable couch. It is especially to be commended for applications of heat to the ischium, for intercostal neuralgia and the like, and is a very convenient method for inducing perspiration.

Formaldehyde as a Milk Preservative.— A. G. Young (*Proceedings of American Health Association*, November, 1899; *Medical Record*, Nov. 11, 1899) makes the following conclusions in regard to the action of formaldehyde as a preservative of milk: 1. Used as a preservative, it tends at least to impair the nutritive value of milk. 2. Its tendency is to interfere with the digestive processes. In either case it is only a question of dosage, and the limit of safety is difficult to determine. 3. Though the inhalation of formaldehyde gas is much less dangerous than the breathing of the other gaseous agents much used as disinfectants, the results of tests upon animals, and of one case of accidental poisoning of a human being, indicate that formaldehyde taken into the digestive system may produce dangerous and even fatal results. 4. It would be unwise and unsafe to encourage

or to suffer the use of formaldehyde in the public milk supply, even under any possible restrictive regulations. 5. In every State, as is now the case in many, there should be a law prohibiting with effective penalties the use in milk of any chemical preservative whatsoever.

Hydrotherapy in Gynecological and Obstetrical Practice.— Ödön Tuszkai employs hydrotherapy under four different forms in the treatment of acute and chronic disease of the female pelvic contents. These are sitz baths, irrigations, packs or compresses, and continuous applications of heat or cold by means of water coils. Of these the sitz bath is the most widely applicable and useful; the portion immersed should be from the middle of the thighs to the umbilicus. The effect of such a cold bath is to produce plethora of the cerebral vessels with attendant eye symptoms, buzzing in the ears, dizziness, increased respiratory and cardiac activity, with a pulse first rapid and irregular and then slow. The cause of these symptoms is the strong vasoconstriction due to reflex stimulation of the splanchnic nerves, and which produces a local drop in temperature and reduced blood current at the surface with the opposite effects at the periphery and in the interior. This is the result of a bath of short duration (five or six minutes), which is indicated in all conditions of atony, relaxation, etc., when there is no inflammation; if, however, it be continued for from fifteen to twenty minutes, contraction of the deep vessels and hyperemia of surface takes place. Warm sitz baths produce superficial congestion and anemia of the pelvic viscera, but here the reaction sets in much sooner than with the cold applications, and a state of great relaxation supervenes, which contraindicates the procedure in any conditions in which congestion or hemorrhage is to be feared. — *Medical Record, Sept. 15, 1900.*

Horseflesh Sausages.— According to the *Medical Review of Reviews*, a short time ago a steamer was launched at a north-east port of Scotland with special equipment for the pitiable traffic of conveying worn-out horses to the Continent for human food. There is some reason to believe, however, that we consume not a few of our own old horses, but there is this to be said, that if we do, we are cheated into it. In view of the belief that a considerable trade is done in horse sausages, the sanitary inspector of Glasgow procured two samples, which were strongly suspected to be of horseflesh, and submitted them to one of the city analysts. Everything pointed to the confirmation of the suspicion, but the authorities had to stop short of prosecuting the venders through the inability of the method of testing at present in vogue to distinguish between glycogen and dextrin. Until chemical science can accomplish this, we shall be unable to compel our horse-sausage dealer to proclaim himself as such to the public.

On the Pathology and Therapy of Angina Pectoris.—Dr. Theodor Schott (*Lancet*, Sept. 8, 1900) adheres to the Stokes-Parry theory of the causation of angina pectoris; *i. e.*, that it is due, not to an increase, but to a further reduction of the muscular energy of a heart already enfeebled. The associated pathological processes are sclerosis of the coronary vessels, alterations of the aortic valves, and ectasic aortitis, which latter has a special stenotic effect upon the origin of the coronary vessels. These conditions, together with the resistance of the contracted arterial system, induce weakening of the heart. A moderate distention of the heart may lead to a temporary occlusion of the coronary vessels at the point of an already existing constriction, and so bring on an attack of angina pectoris. In other cases, a thrombus or embolus may be the cause of the block.

In the treatment of the anginal fit itself, the writer prefers nitroglycerin to amyl nitrite. External dry heat is often of service. For the treatment of the heart in the intervals between attacks the author recommends the Nauheim baths, as introduced by himself and his brother, but lays stress upon the fact that advanced sclerosis contraindicates this treatment. —*New York Medical Journal, Sept. 22, 1900.*

Report of a Case of Carbolic Acid Poisoning Successfully Treated with Alcohol.— H. Rodman (*Med. Rec.*, July 14, 1900) details a case of a woman, aged sixty years, who swallowed the contents

of a two-ounce bottle of carbolic acid. When he arrived, she was unconscious. Her lips were cyanotic, conjunctival and pupillary reflexes absent, limbs cold, pulse weak and thready, temperature per rectum 96.2°; eschar upon lips and tongue. Having four ounces of alcohol at hand, he passed a stomach-tube and through it poured the alcohol into the stomach, allowed it to remain for three or four minutes, then washed the organ with dilute alcohol. The woman gradually recovered consciousness, pulse improved, her cyanosis disappeared. Stimulants, strychnin and alcohol, were given hypodermically; mucilaginous drinks, with Epsom salts, by the mouth. Some reaction followed, temperature 102°, pulse 110; urine drawn by catheter was dark and smoky; nasopharynx was painful, which he thinks could have been obviated if it had been sprayed with alcohol. The stomach was not tender, and in five days the patient had completely recovered.— *International Medical Magazine, September, 1900.*

The Clinical Significance of Casts.— Kobler (*Wiener Klinische Wochensch.*, No. 14, 1900) says that at the present time the finding of granular and epithelial casts does not absolutely signify the morbid condition of Bright's disease, while formerly this was considered as proof positive. Kobler studied this question carefully, and concluded that the presence of casts does not always justify a diagnosis of Bright's disease. The true significance of hyaline casts is not known. Granular and epithelial casts are often found when no morbid condition of the kidney exists, but when there is gastrointestinal disease, especially when the latter is accompanied by violent diarrhea. This causes a lowering of the blood pressure on account of the rapid loss of water; hence a faulty metabolism of the renal epithelium and formation of casts and albumin. On the other hand, Kobler has found these casts when obstipation exists. This condition is preceded by pain, which at times is very severe; this pain is considered as a reflex to the contraction of the kidney capsule, which consequently deprives the renal epithelium of its proper nutrition. — *Medical Fortnightly, October 25, 1900.*

Lepers in the Philippines.— It is estimated that there are thirty thousand lepers in the Philippine Archipelago, mostly in the Visayas Islands. The Spaniards, during their occupation of the Philippines, made no attempt to segregate these unfortunates. In a recent inspection by the health-department officials at Manila, one hundred lepers were found concealed in houses, while a large number, getting wind of the proposed inspection, had fled. The government now proposes to select some place where a leper colony will be established similar to that of Molokai. A board of officers, consisting of Major Louis M. Maus, surgeon, U. S. A.; Capt. George P. Ahern, Ninth Infantry, and Capt. W. E. Horton, are selecting a suitable site for the leper colony.— *New York Medical Journal, Sept. 22, 1900.*

Great Increase in Mortality from the Use of Alcohol.— During the year 1898 the consumption of whisky was the highest ever reached in the United Kingdom, being more than a gallon per capita for every man, woman, and child. Compared with 1878, there has been an increase in death, from chronic alcoholism of 82.5 per cent among men, and 145.5 per cent among women.

Classification of Baths according to Temperature.— While a classification of baths according to temperature must necessarily be more or less arbitrary, the following classification is a very convenient and practical one : —

Very cold	32° F. to 55°
Cold	55° " 65
Cool	65° " 80°
Tepid	80° " 92°
Warm (or neutral, 92° to 95°)	92° " 98
Hot	98° "104°
Very hot	104° and above.

Pruritus of Jaundice.— Leichtenstein (*Aertzl Rundsch*) recommends the following as being of service in pruritus of jaundice: menthol, zinc oxide, of each 1; starch powder and French chalk, of each 6. Mix and apply.

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

Preliminary Report on the Presence and Nature of Parasitic Amebæ (Cancriameba Macroglossa) in the Epithelial Carcinomata.— Dr. Gustav Eisen, in a paper which appeared in the July 7 number of the *Medical Record*, makes the following summary: —

1. A parasitic ameba (cancriameba macroglossa) is found in all epithelial carcinomata. This ameba may be readily fixed while in action, if the tissue is fixed while yet warm, the lowering of the temperature below that of the blood causing the amebæ to contract.

2. The cancriamebæ are the cause of the characteristic structure of epithelial carcinomata in which are found cell nests or cell plugs. In each such nest we can always distinguish two distinct parts,— an inner core or ameba nest consisting mainly of one or many cancriamebæ mixed with some leucocytes and loose epithelial cells, and an outer zone consisting of epithelial cells, the inner ones of which are flattened, concave, and in sections lunate, while the outer ones are normal.

3. The peculiar structure of these cancer plugs is caused by the effort of the epithelial cells of the infected locality of the human body to fence in the amebæ, and prevent them from spreading through the tissue. This effort is also more or less successfully accomplished by an enormous increase in epithelial cells and by a chitinization of the cells nearest the cancriamebæ. The concentric structure of the cancer plug is the result of the pressure on the epithelial cells caused by the cancriamebæ situated in the center of the cancer plug through continuous increase in number and size.

4. A constant struggle is going on between the cancriamebæ and the epithelial cells. The latter are trying to fence in the amebæ and to kill them by encysting or by chitinization, while the amebæ, on their side, feed on the epithelial cells by projecting pseudopodia into the cells and sucking out their cytoplasm. The cancriamebæ are not caryophagues.

5. The propagation of the cancriamebæ is by spores and by amitotic division. Mitotic division has not been observed. There are numerous cells in mitotic division all through the tissue, but these cells seem to be exclusively epithelial cells.

6. The cancriamebæ are nearly always found surrounded by a small vacuole. This vacuole is the result of the destruction of one or more epithelial cells by the parasites. The vacuole becomes gradually larger as more and more cells are destroyed, until finally, when the epithelial cell fence gives way and breaks up, a large pus cavity is formed, containing cancriamebæ, fragments of epithelial cells, and leucocytes.

7. The cancriamebæ are distinguished from all leucocytes by their larger size, while the leucocytes seldom reach ten to twelve micromillimeters in diameter; the cancriamebæ frequently exceed twenty-five to thirty micromillimeters in length. Many of the cancriamebæ possess a vacuole, an organ never found in the leucocyte.

8. The acute sensitiveness to cold suggests the treatment of carcinomata by freezing.

New Technique for Staining Tubercle Bacillus.— Dr. Randle C. Rosenberger (*Journal of Applied Microscopy*) is of the opinion that most people make the spread entirely too thin; he advocates having a good layer of the material to stain. The method practically recommended is one devised by Rosenberger, and used by him for some time with gratifying and reliable results. The essential feature of his method consists in the substitution of sweet spirits of niter as the bleaching agent instead of the sulphuric or nitric acids usually used. The sweet spirits of niter and methylene blue are combined with malachite green, Bismarck brown, and gentian violet. In this method the preparation is first stained with carbol fuchsin for five or ten minutes; then the mixture is placed upon the spread, after washing off excess of carbol fuchsin for one or two minutes, and washed with water. If a green or blue color is not present, place the solution on again and wash with water. In specimens of urine where so much granular débris is present, and in some old specimens of old sputum,

this method is particularly applicable. The reason is that the niter dissolves out all fatty, granular particles, and leaves a clean-cut, well-defined field behind. The smegma bacillus is also decolorized with this stain. Where the sweet spirits of niter and the malachite green mixture is used, a beautiful contrast stain is obtained, green being the complimentary color of red. In making up the mixture, enough of the stain, malachite green or methylene blue in fifty per cent dilute or saturated alcoholic solution, is added to the niter to make a deep green or blue fluid; the same with Bismarck brown. Tubercle bacilli in tissues may be stained by this method, a longer application of the counter stain (five minutes) being needed, however. The specimen is then washed in water, nearly dried, and placed in carbol xylol balsam. The bacilli are stained red, the tissue a brown, blue, or green, according to the stain used. The advantages claimed for this method are (1) that it is easy to prepare; (2) that it gives a clearer, better defined field; (3) that it does not destroy the tissue, as is sometimes the case with H_2SO_4; (4) that it acts more quickly and surely; (5) that it keeps indefinitely.

Bacteriology and Medicine.— Bacteriology has relations with every department of clinical medicine, according to Richard C. Cabot, in the Boston *Medical and Surgical Journal* for May 10. It has to do with etiology, diagnosis, symptomatology, and the course of disease, prognosis and treatment. By its aid we have the causes of diphtheria, tuberculosis, bubonic plague, tetanus, anthrax, cholera, relapsing fever, influenza, gonorrhea, glanders, erysipelas, actinomycosis, and typhoid. So the busy physician can not afford to despise this new science, for when properly used, it is of incalculable assistance in the successful treatment of disease.

The writer calls the attention, however, to a very important point, that failure is the result when we try to divorce the laboratory findings from the clinical aspects of the case, for in setting the one over against the other, error is almost sure to creep in. They are inseparable, and must always be used together, and for this reason he advises that the clinician should, if possible, be his own bacteriologist, or at least allow his assistant to make the examinations, as he will be familiar with the clinical history of the case. Otherwise the most conscientious bacteriologist may convey a wrong impression through a written report to the attending physician. — *Charlotte Medical Journal.*

Bacterial Illumination.— M. Dubois, according to the *Revue Scientifique*, is conducting a series of experiments with luminous germs, with results which he believes give promise that sometime in the future this source of light will be used for ordinary illumination.

"To produce the physiological light with its maximum illuminating intensity speedily and practically, he conceived the plan of cultivating certain luminous microbes, or 'photobacteria,' in liquid bouillon of special composition, and he established the following fact: —

"When these liquids are stocked with good cultures in the mean limits of atmospheric temperature, luminous liquids may very quickly be obtained. Placing these in glass vessels, preferably with plane faces, properly arranged, a room may be so brightly lighted that the features of a person may be recognized at several yards' distance, print may be read, and time may be told by a watch, especially in the evening, when the eye has not been dazzled by full daylight, or after remaining a few minutes in a dark or feebly lighted room."

Germs in "Holy Water."— Abba, a health officer of Turin, Italy, has recently made bacteriological examinations of specimens of holy water. In all he examined thirty-one specimens from as many different churches. The results of his investigations clearly demonstrate that this water may be an effective means of transmitting disease.

A New Pathological Bacillus.— Dr. Flechner, a member of the Medical Commission to the Philippines, has discovered a bacillus which he has announced to be almost certainly proved to be the cause of the acute dysentery so prevalent in that country.

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THE MOSQUITO IN MALARIAL INFECTION.

THE experiments which have been carried on by Koch on the west coast of Africa, and others in progress at the present time in various parts of the world, are bringing more and more into prominence the importance of the rôle played by the mosquito in malarial infection. As a crucial test of the theory, Sambon and Low, two London physicians, undertook to live from June till October on a part of the Campagna, the great marsh adjacent to the city of Rome, Italy, where malarial infection is so virulent that a person spending the night there under ordinary circumstances rarely ever escapes suffering from an attack of malarial fever. When the writer visited this malaria-infected spot a dozen years ago, he noted a number of small houses perched upon the ruins of ancient tombs, some twenty to thirty feet above the ground, and approached by ladders. Scattered over the Campagna in the distance could be seen many similar huts erected on high posts. An intelligent Italian gentleman who was acting as guide gave the information that the purpose in placing these dwellings so high above the ground was to avoid the malarial infection, and that those who took care to sleep only in these aerial habitations were quite free from the disease, while those who slept near the ground were certain to be infected. The theory held by Drs. Sambon and Low was that the infection occurs only through the bites of mosquitoes.

The *British Medical Journal* gives the following interesting account of this experiment: —

"Dr. Sambon, Dr. Low, Signor Terzi, and their servants have now exposed themselves to the pestilential influence of this valley of the shadow of death for over two months. They live in a mosquito-proof hut. . . . They take no quinine or other drug which might be regarded as a prophylactic. Not one of the experimenting party has shown the least sign of infection. We are able to make this statement on the best authority. . . . We may now, with as much confidence as the uncertainty of human things warrants, look forward to a successful completion of this important experiment. Satisfactory as such a consummation will be from a scientific point of view, it will also be matter for gratification that the men who have in the cause of humanity deliberately exposed themselves to a most serious risk have not had to suffer for the scientific faith that is in them."

Dr. Elliott, of Liverpool, who some years ago was sent out to Nigeria to study the same subject, reports that the members of his expedition spent several months living in the marshes and in the most thoroughly infected places. They only took care to protect themselves by mosquito nets at night, and quinine was not administered, but no one suffered from the disease.

An English physician made his son the subject of experiments, allowing him to be bitten by mosquitoes which had been fed with malarial parasites. The boy in due time became sick with the double tertian.

It may not be entirely proved as yet that the mosquito is the only source of malarial infection. There are those who believe that infection occurs through the alimentary canal and through the respiratory organs, but enough is known to

make it clear that one living in malarial regions should exercise the greatest care to avoid mosquito bites.

Experiments have shown that the variety *anopheles* is principally responsible for the malarial infection, but other varieties may communicate the disease, and it seems reasonable to suppose also that in time it may be shown that other small creatures which prey upon man may likewise be a means of communicating the disease. For example, the cattle tick infects Northern cattle imported into Texas with Texas cattle fever, the active cause of which has been shown to be animal parasites in many respects resembling the malarial parasite, and which, like the parasites of malaria, destroy red corpuscles.

Ross has suggested that the harmless species of mosquito, the *Culex* family, may be properly termed the "city" or "town mosquito," because it may breed anywhere — in tubs of water, cisterns, drains, and pots; whereas the anopheles is a country mosquito, breeding only in ponds, pools, and those bodies of water large enough to be permanent in character and yet not containing fish, which devour the larvæ.

Observations made in the Sierra Leone showed that a single infected mosquito may infect several persons with malarial fever. The anopheles was found in every room in which a person was sick with malarial fever.

The theory has long been maintained that malaria arises from stagnant water. It seems doubtful if this theory can longer be held. Malaria is communicated from stagnant water only because the anopheles family of mosquitoes breeds in stagnant water. The malarial parasite is quickly destroyed by drying. It seems that it is, like the tapeworm, a parasite which is communicated from one host to another. It is not the malaria that comes from moist soil, ditches, or stagnant pools, but rather the mosquitoes, which carry the malarial parasites and their spores in their stomachs.

Malaria is, then, simply a parasitic disease, like trichinosis and tapeworm, which are carried from man to man by an intermediary host, in this case an insect; in the case of tapeworm, the ox; and in the case of trichinosis, the pig.

INFECTION INCREASED BY THE USE OF ALCOHOL.

WHILE direct experimentation upon man for the purpose of determining whether or not the use of alcohol renders him more susceptible to infection, has not been undertaken, every physician is fully cognizant of the fact that when an alcoholic habitué becomes diseased, his chances for recovery are much less than those of the total abstainer. The inebriate who contracts pneumonia — a disease to which on account of his indulgence in alcoholic beverages he is prone — stands a very poor chance of recovery. The surgeon also recognizes the inability of wounded tissues of the drunkard successfully to combat infection and to heal by first intention. Because of these conditions the surgeon frequently hesitates to operate upon such an individual.

While these facts have been familiar for years, very little has been done to determine the real cause which in such cases renders the vital principle of the body unable to cope successfully with disease-producing agencies.

Some years ago Dr. Abbott carried on a number of experiments which had a practical bearing upon this subject. His experiments consisted in feeding rabbits upon alcohol, and later inoculating them with some pathogenic micro-organism. The result showed that in every case, control animals were much less susceptible to infection than the animals which had been fed upon alcohol, thus clearly demonstrating that alcohol greatly decreases

the ability of the animal body to resist disease.

Dr. Laitinen (*Zeitsch. f. Hyg. und Infect.*, July 19, 1900; *Br. Med. Jour.*, September 23) recently conducted a number of experiments similar to those of Dr. Abbott. In these experiments Dr. Laitinen used 342 animals — dogs, rabbits, guinea pigs, fowls, and pigeons. The animals were inoculated with anthrax, tubercle, and diphtheria bacilli. These were chosen as types of acute infection, chronic infection, and pure intoxication. A twenty-five-per-cent solution of ethylic alcohol in water was used in most cases. When employed in greater strength, the alimentary mucous membrane of birds became inflamed. In a few cases dogs were given fifty-per-cent solutions of alcohol.

The alcohol was administered either by an esophageal catheter, or by dropping it into the mouth by means of a pipette. The dose was graduated according to the weight of the animal, being from one and one-half c.cm. in the pigeon to sixty c.cm. in some of the dogs. It was administered in a variety of ways and for varying times; sometimes in single large doses, at others in gradually increasing doses for months at a time, in order to produce here an acute and there a chronic poisoning. In all cases Dr. Laitinen found that without exception the effect of the administration of alcohol, in any form whatever, was to render the animal distinctly, sometimes markedly, more susceptible to infection than were the controls.

Such convincing proof of the devitalizing nature of alcohol should certainly carry a great deal of weight with it, especially when obtained by such eminent investigators. This, coupled with the practical experience of the physician in dealing with patients who have been in the habit of using alcoholics, should be a warning against the administration of alcohol in any form; for the object to be sought in the treatment of disease is to increase the vital activities of the tissues, and thus render them more resistant to infection.

The administration of alcohol for the purpose of increasing bodily resistance is certainly in nowise a rational or scientific procedure, and its use is certainly not upheld by men who have carefully studied its therapeutic properties.

C. E. S.

The Necessity of Disinfecting the Urine of Typhoid Fever Patients.— The necessity of disinfecting the urine of typhoid fever patients has not been fully sensed by the majority of physicians and nurses. Undoubtedly this has been due to the fact that the feces have been considered the only medium whereby the typhoid bacillus leaves the body; consequently efforts to destroy them have been confined to their destruction in the ingesta and egesta of the alimentary canal.

Recent investigations, however, have shown that the bacillus of typhoid fever is not infrequently found in the urine, some investigators stating that in as many as fifty per cent of cases, typhoid bacilli are to be found in the excretion from the kidney.

In most cases the germs appear in the urine rather late in the disease, and continue to be excreted after all other symptoms of the disease have subsided.

In all probability the obscure source of some epidemics of typhoid might be traced to infection from the urine of typhoid fever patients.

Recognizing the fact that typhoid bacilli are frequently excreted from the body through the urine in very large numbers, the necessity of thoroughly disinfecting the excretion becomes at once apparent, and no pains should be spared to prevent its being recklessly handled. It is a very easy matter for the urine to contaminate hands, clothing, furniture, etc., and thereby create new avenues of infection.

The excellent results obtained by thorough disinfection of food and feces in preventing the spread of typhoid fever may, we believe, be increased by careful and thorough disinfection of the urine of these patients. C. E. S.

REVIEWS.

THE AMERICAN ILLUSTRATED MEDICAL DICTIONARY.— A new and complete dictionary of the terms used in medicine, surgery, dentistry, pharmacy, chemistry, and the kindred branches, with their pronunciation, derivation, and definition, including much collateral information of an encyclopedic character.— By W. A. Newman Dorland, A. M., M. D., assistant obstetrician to the University of Pennsylvania Hospital; editor of the American Pocket Medical Dictionary; Fellow of American Academy of Medicine. The dictionary contains also new and elaborate tables of arteries, muscles, nerves, veins, etc.; of bacilli, bacteria, diplococci, micrococci, streptococci, ptomains, and leucomains; weights and measures; eponymic tables of diseases, operations, signs and symptoms, stains, tests, methods of treatment, etc. It has numerous illustrations and twenty-four colored plates. Price, plain, $4.00 net; thumb index, $5.00 net. W. B. Saunders & Company, 1900. Philadelphia and London.

In this attractive volume the author has very admirably succeeded in placing within reach of the students and practitioners of medicine, dentistry, and pharmacy a dictionary which amply meets the requirements of these professions. The volume is of convenient size for the desk, is well printed and well bound. The definitions are clear and concise, and the pronunciation and derivation of words have received careful attention. The illustrations are well chosen, aiding very materially in making this a first-class medical dictionary.

A GENERAL PHYSIOLOGY FOR HIGH SCHOOLS, BASED UPON THE NERVOUS SYSTEM.— By M. L. Macy, L. B., assisted by H. W. Norris, A. M., Professor of Biology, Iowa College. "The physiology of the nervous system is emphatically the physiology of the future."—*Michael Foster, M. D., F. R. S.* American Book Company, New York, Cincinnati, Chicago.

The authors have in this neat little volume presented the subject of which it treats in a very practical way, considering the nervous system as the foundation. Before considering the nervous system, the cell, the foundation of all living matter, is taken up. The structure of the cell is explained, and the student's attention is called to the fact that the various tissues of the body are simply aggregations of cells, characterized and arranged according to the function they are required to perform, and that they are all under control, and are governed by the nervous system. The anatomy, physiology, and hygiene of the various organs of the body are carefully considered in their turn.

The book is well written, and is undoubtedly one of great value for high-school students.

The Battle Creek Sanitarium

LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
NEWTON EVANS, M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR OCTOBER.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
103 per cent.	16	4	20
100 " "	70	61	131
98 " "	3		3
96 " "	6	16	22
91 " "	8	13	21
88 " "	3	11	14
85 " "	3	6	9
83 " "			1
78 " "		5	5
71 " "	2	2	4
Below 71 per cent.	1	1	2
Total	112	123	235

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm.	39	10	49
Between 4,500,000 and 5,000,000	39	37	76
" 4,000,000 " 4,500,000	24	47	71
" 3,500,000 " 4,000,000	4	20	24
" 3,000,000 " 3,500,000	3	8	11
" 2,500,000 " 3,000,000	3		3
Below 2,500,000		1	1
Total	112	123	235

Examination of Sputum.— There were 36 examinations made, 32 being new cases. Tubercle bacilli were found in 2 cases.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	39	100	11	100	73	85	123	90
Less than 10,000 bac.					4	5	4	3
Between 10,000 and 100,000 bac.					3	3	3	2
More than 100,000 bac.					6	7	6	5
Total	39	100	11	100	86	100	136	100

The patients were received from the following States and countries: Michigan, 22; Illinois, 15; Ohio, 12; Indiana, 11; California, 10; Wisconsin, 8; Pennsylvania, 7; Missouri, 6; Iowa, 6; New, Jersey, 4; Nebraska, 4; New York, 3; Kentucky, 3; Canada, 3; District of Columbia, 2; South Dakota, 2; Washington, 2; Virginia, 2; Georgia, 2; Arizona, 1; Minnesota, 1; Kansas, 1; Montana, 1; Massachusetts, 1; Mississippi, 1; Tennessee, 1; Alabama, 1; Sweden, 1; Germany, 1; Australia, 1; unclassified, 1; total, 136.

Urinary Laboratory.—Total number of specimens examined, 700; number of new cases, 658; number of cases having albumin, 14; sugar, 5; casts, 3; blood, 2; pus, 85.

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" " " Cosmopolitan, and Pearson's	4 00	2 50
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MODERN MEDICINE

VOL. IX. BATTLE CREEK, MICH., U. S. A., DECEMBER, 1900. NO. 12.

THE HYDRIATIC TREATMENT OF TUBERCULOSIS.[1]

BY J. H. KELLOGG, M. D.,
Superintendent of the Battle Creek (Mich.) Sanitarium.

SINCE the empiric, Priessnitz, of Graefenberg, created a world-wide interest in the curative properties of thermic applications by means of water by restoring to health multitudes of chronic invalids whose cases had been considered incurable, it has been known that hydrotherapy possesses a marvelous restorative power in pulmonary tuberculosis. Winternitz, of Vienna, has published most favorable statistics, and Aberg, in an admirable and interesting paper published in 1890, gave an account of a large number of cases successfully treated by hydriatic means which had stubbornly resisted other measures. Numerous other writers have presented papers on the same subject, especially during these last few years, among which the writer desires to call special attention to the paper of his colleague, Dr. W. H. Riley, of the Colorado Sanitarium, Boulder, Colo.

I have made extensive use of hydriatic methods in the treatment of pulmonary tuberculosis during the last twenty-five years, and will endeavor to present in this a brief account of the methods which I have found especially helpful as curative agents and as palliatives of the various distressing symptoms complicating morbid conditions, which attend this malady in its several stages.

That the natural curative powers of the body are capable of successfully combating tuberculous disease is shown by the fact that the reports of pathological laboratories in this country as well as in Europe show tuberculous lesions in half of all the cases examined post-mortem.

The fact that, although nearly all human beings are almost constantly exposed to infection by the bacillus of tuberculosis, all do not contract the disease, clearly indicates that the bacillus alone is not sufficient to give rise to pulmonary tuberculosis. The soil in which the tubercle germ flourishes best is found in the tissues of a deteriorated organism; and it is without doubt the lowering of the vital status of the individual, the lessening of his resistance to pathogenic agents, which from a therapeutic standpoint must be regarded as the real foundation of this formidable malady. This statement is based upon two potent facts: (1) It is impossible directly to destroy the tubercle bacilli when once they have obtained a foothold in the lungs, without the employment of such measures as will destroy the living tissues as well as the parasitic microbes. For this reason all the methods of treating pulmonary tuberculosis which have been addressed exclusively to the destruction of the bacillus have proved unsuccessful. (2) Even if the bacillus could be destroyed by germicides or by other means, a return of the disease must be expected, for it is practically impossible to escape exposure to infection, and when infection of an organism has once occurred, the fact is evident that the individual is susceptible to the disease; that is, his vital resistance has been lowered to such a degree, and the defenses of his body so deteriorated, that he is no longer able to resist the invasion of these pathogenic agents.

I hold that the most important thing to be done in dealing with any case of tuberculosis, aside from meeting such indications as are necessary to contribute to the patient's comfort or to arrest some process likely to prove immediately fatal, is to build up the person's vital resistance, to improve the quality of his tissues, to raise his whole vital status, and to recover, as far as possible, his original ability to resist the invasion of parasitic

[1] Reprinted from *Medical News*.

organisms and to destroy them when they have gained entrance to the body. The healing power of all disease is in the body itself. Disease of whatever character or origin,—acute, chronic, idiopathic, traumatic, or infectious,—if recovered from, must be conquered by the body itself. The healing power is in the tissues within the body. The blood is the great healing agent. Improved quality and quantity of blood and increased movement of blood through diseased parts are the things most essential to be accomplished in dealing with a chronic malady of any sort. Hydriatic applications afford the most powerful of all means of awakening and increasing vital resistance in the body, accelerating tissue change, blood-making, and all the vital activities of the body which are essential to life, and which participate in the defensive and the curative processes.

In the eager search for new remedies and methods by which to combat this most formidable of human maladies, it is indeed singular that a method so well tested and proved as hydrotherapy should be almost universally overlooked. All sorts of measures for influencing the pulmonary mucous membrane have been devised, exploited, and tested by practical experience, and generally found wanting. Moist air, dry air, cold air, superheated air, air medicated with almost every known volatile agent, from the aromatic extract of pine leaves to malodorous sulphuret of hydrogen, have been applied to the mucous membrane of the lungs by inhalation, while the important fact that the pulmonary circulation and the respiratory functions, not only in the lungs, but in the tissues, can be far more certainly and powerfully influenced by thermic applications to that wonderful organ, the skin, has been overlooked.

It is pretty well admitted on all sides that the open-air treatment of consumption, with proper diet, carefully graduated exercise, especially contact of the body under proper conditions with cold air, constitutes a better means of combating pulmonary tuberculosis than any system of medication. Exercise and cold air are chiefly helpful by their influence upon metabolism and movement of the blood. Exercise influences especially the heart and respiratory movements, while cold air acts chiefly through the thermic impressions and the vasomotor changes and metabolic activities resulting therefrom. Patients who are able to exercise freely in the open air, if other conditions are favorable, generally improve, but the elevation of temperature and the tendency to emaciation so commonly present in this disease often interdict exercise, and not infrequently require absolute rest. While rest favors the accumulation of residual tissue, it has the great disadvantage that it lessens excretion, diminishes respiratory movement, lessens the general movement of blood in the body, and lowers vital resistance. It is preferable to exercise only because exercise tends to produce elevation of temperature, even in normal conditions, and when the heat-regulating functions of the body are disturbed, as is already the case in a febrile state, even very gentle exercise may produce a very great elevation of the temperature curve. Elevation of temperature likewise gives rise to excessive oxidation of nitrogen, which is still further aggravated by exercise, thus causing muscular wasting and resulting weakness with lessened nervous and glandular activity.

The curative effects of cold applications to the skin are based upon the same principle, and act as do those of exercise and cold air. A cold application at first excites cardiac activity, the heart later being slowed by the increase of arterial tension which quickly follows a cold application. The peripheral heart, the small vessels of the skin and muscles, especially, are excited to increased activity, opening more widely, while at the same time their rhythmical activity is accelerated.

Thus the general movement of blood throughout the body is accelerated, while arterial tension is elevated. The irritation of cold when brought in contact with the skin raises the nerve tone as well as vascular tone, stimulating all forms of vital activity. It is in this way that the appetite is stimulated by exercise in cold air, by sea bathing, by cold impressions made in any way. Pawlow, in his beautiful experiments for the purpose of determining the conditions which influence the secretion of the gastric fluids, showed very clearly the intimate connection between the appetite and the gastric secretion. He observed that the stronger the appetite the greater the amount of secretion. The absence of appetite, especially in febrile conditions, is a clear evidence of a lack of digestive power. There is

abundant experimental evidence to support the power of cold cutaneous applications to stimulate the production of hydrochloric acids and ferments. Cold applications to the skin likewise stimulate respiratory activity. A dash of cold water upon any portion of the body, especially upon the chest, produces very deep involuntary inspiration by exciting the respiratory centers. After a general cold application or the application of a cold chest compress, there is a marked increase in the depth of the respiratory movements for a considerable length of time. The amount of tidal air may be increased, as shown by my own experiments with the cold towel rub, immediately after the application 33 per cent, forty minutes after 10 per cent; wet-sheet rub immediately after 36 per cent, thirty minutes after 12 per cent, and an hour after 8 per cent; the chest pack immediately after 33 per cent, thirty minutes after 18 per cent, and an hour after 4 per cent; and cold mitten-friction immediately after 39 per cent, and thirty minutes after 8 per cent, on the respiratory volume. The respiratory quotient is also increased, showing the enormous increase in the absorption of oxygen by the blood and the oxygenation of the tissues.

FIG. 1.—COLD MITTEN FRICTION.

Hydrotherapy is thus not only a powerful ally of the open-air treatment of pulmonary tuberculosis, acting as an adjunct of exercise, sunlight, cold or cool air, proper diet, and other hygienic conditions and physiological measures, but it is actually indispensable in a large number of cases in which the patient is so feeble, either from loss of blood or reduction of strength or some other cause, that the advantages of the open air method are only in a small part available. In these cases hydriatic measures properly adapted to individual cases serve as a substitute for cold air and exercise, and have the advantage over both these measures in the fact that they are capable of absolute regulation and graduation, awakening within the system the same reactions, more or less ample and intense, as may be desired, and thus serving as a means by which the patient may be lifted from a state of utter helplessness by daily increments of energy until he becomes capable of utilizing with advantage more vigorous measures.

Hydrotherapy is of special value during the hot months of the summer season, which are exceedingly trying to the tuberculous patient, as a means of antagonizing the debilitating effects of heat. Observations with Mosso's ergograph show that extreme muscular and nervous exhaustion resulting from the hot bath may be instantly removed by a cold application. Not only is the depressing effect of the hot bath wholly antidoted by the succeeding cold application, but the output of energy may be raised even above the normal level. During the winter months, when out-of-door exercise is in many localities not infrequently prohibited for weeks at a time by inclement weather, except in cases of those who have been systematically trained to endure contact of the cold bath, hydrotherapy is invaluable as a substitute for the tonic influence of cold air and exercise.

Hydrotherapy affords the most valuable of all known means of training the skin. General cold applications may be properly termed "vasomotor gymnastics," in which not only the skin but the vasomotor centers controlling the cutaneous circulation are brought into vigorous exercise. By the daily repetition of the cold bath systematically graduated from higher to lower temperatures, the ability of the skin to react quickly to thermic impressions may be enormously increased. A healthy, well-trained skin contracts vigor-

FIG 2.—WET SHEET RUB (FIRST STEP).

ously when a cold impression is made upon it. Not only the blood vessels, small arteries, and veins, but also the lymphatics, even the capillaries, and all the muscular structures of the skin contract, thus lessening the blood supply and preventing the undue cooling of the blood which gives rise to chill and taking cold. In no class of cases is this training of the skin and the protection which it affords more necessary than in cases of pulmonary tuberculosis. The cold bath affords the only means by which this training can be accomplished, and hence it is indispensable to the rational treatment of this malady.

Cold water is a physiological tonic, and has the advantage over the medicinal tonics of all sorts in that it awakens nervous activity without the imposition of any extra burdens upon any vital organs, and without hampering the activity of any function. The cold bath employed in such a manner as to produce tonic effects accomplishes its results by increasing vital resistance to the causes of pathological processes by making the wheels of life run more smoothly, by lifting the whole vital economy to a higher level. The impression made upon that harp of a million strings — the skin, with its vast network of sensory, motor, sympathetic, vasomotor, and thermic nerves — arouses every nerve center, every sympathetic ganglion, every sensory and motor filament in the entire body to heightened life and activity. Every blood vessel throbs with quickened impulses, the whole being is translated into a new state of existence.

A person who has never experienced the glow of exhilaration, the invigoration and buoyancy of body and mind, which accompany the state of reaction from a short, general cold application, can not well appreciate the value or significance of the cold bath as a physiological stimulant. It is not too much to say that it is, of all measures known to man, the most valuable as a means of arousing to activity the flagging energies of the body and of uplifting the enervated invalid out of the organic and functional disorders of chronic diseases.

The tonic effects of cold water are unquestionably, to a large degree, due to the influence of cold impressions acting through the nerves of the skin upon the sympathetic nerve centers. The awakening of the sympathetic to renewed activity, or a balancing of its action, is what is especially needed by the great majority of chronic invalids. The functions of the brain and spinal cord, and through them all forms of nervous activity, are, to a considerable extent, influenced by the sympathetic. The sensation of well-being which accompanies the reaction following a general cold application is largely due to the increased activity of the cerebral circulation brought about through the stimulation of the sympathetic. By its power to influence the sympathetic, hydrotherapy is capable of controlling, reorganizing, balancing, all the processes of organic life, and through them, modifying the functions of animal life to a marvelous degree.

FIG. 3.—WET SHEET RUB (SECOND STEP).

The methods by which the powerful restorative effects of water may be obtained are exceedingly simple. They

do not require elaborate apparatus or hospital appliances, although they do require the use of judgment and discretion in their application.

The general method pursued by Aberg consists in the application of cold water, the intensity of the application being systematically increased. Aberg divides his hydriatic applications into three grades, which may be briefly described as follows: (1) Bathing of the face, neck, and the anterior and posterior surfaces of the chest with a sponge dipped in cold water and wrung dry. The application is at first very short, and is immediately followed with drying and friction of the parts. The patient remains covered in bed or exercises in the open air until reaction is complete. The application is first made but once a day — in the morning; later, both morning and evening, the sponge wrung a little less dry each day. (2) Cold water is poured over the head, neck, face, back, and breast of the patient from a watering pot, each part being gone over one or more times as the treatment progresses. The parts are then dried and rubbed as before, and reaction promoted by rest in bed or exercise. (3) Immersion of the whole body in the full cold bath, followed by immediate drying with vigorous rubbing. The bath is of very short duration (two to six seconds).

Ice water is used for the sponging and the sprinkling with a watering pot. Water at a temperature of 45° to 54° F. is used for the full bath. Aberg claimed for his method the suppression of the night sweats and fever within a few days after the beginning of treatment in most cases, and a notable increase in appetite and body-weight, often very rapid and marked, and improvement in all respects.

The method of Winternitz is somewhat less heroic than that of Aberg. He employs ablution in place of sponging, and wet-sheet rubbings (45° to 48° F.) in place of the sprinklings; and the cold rain douche or plunge bath at 54° to 58° F. Winternitz employs also the chest pack, of which Aberg seems to make no use.

The method which I have formulated and from which I have seen excellent results differs somewhat in detail, although not in principle, from that pursued by Aberg and Winternitz. Four different sets of procedures are employed for producing general effects, each of which is capable of being graduated to any degree desired. These are as follows: —

FIG. 4.— WET SHEET RUB (THIRD STEP).

1. Dry friction of the whole surface with the naked hand protected with a friction-mitt. The friction should be continued until the surface is warm, and vigorous cutaneous circulation well established. The dry friction is followed by friction with the hands dipped in water at 60° F. The temperature of the water is lowered one or two degrees each day until ice water is used, and the number of dippings of the hand in the water is each day increased. The parts are carefully rubbed, then dried, and rubbed with the hand until warm and red. This application should be made twice a day, — in the morning before the patient rises, and at night after retiring.

2. Cold, wet friction with the friction mitt (Fig. 1) dipped in water, extending over the whole surface of the body, to be applied first, once daily, preferably in the morning; later, twice a day, in the evening as well as in the morning, application being substituted for the wet-hand rubbing. The application should be made to small areas of the skin in succession, each part being well rubbed until red, then well dried, and rubbed with the hand before extending to another area. The patient should not be allowed to become chilly. The temperature of the water should be at first 60° F., and then should be gradually lowered from day to day until ice water is employed. The rate at which the temperature is lowered may vary from one to two degrees, according to the susceptibility of the patient. The patient, if feeble, should

remain in bed until good reaction has occurred. If strong enough to do so, the patient should walk after treatment for fifteen to twenty minutes, or exercise moderately for an equal length of time in a gymnasium to promote reaction. If the reaction is not complete, pulmonary congestion, cough, and other ill effects will be apparent. The feet and hands, as well as the general surface of the body, should show good reaction, as indicated by warmth and natural color. Coldness of the hands and feet after the operation indicates defective reaction, and requires heating processes of some sort, as a short fomentation to the spine, or warming of the hands and feet by means of rubber bags filled with hot water, or immersion in hot water for a few minutes before the application, and more thorough rubbing in connection with the cold application.

FIG. 5.— WET HAND RUB.

3. The wet rubbing-sheet at 60° F., the temperature being gradually lowered to 50° F. This application is best made in the morning when the patient rises warm from the bed. It should be taken in a warm room. After the application, if the patient is feeble, he should return to bed and remain there until thoroughly warmed, but if strong, he may exercise moderately from fifteen to twenty minutes to promote reaction. The duration of the application should be from one to three minutes. If the patient's temperature is subnormal in the morning, the application should be made later, as at 10 or 11 A. M. It is well in such cases also to precede the cold application by heating the skin by the sun bath, the electric-light bath, or the skin may be warmed by dry friction.

In the absence of other measures, an improvised vapor bath may be employed for two to three minutes, or the patient may be subjected to the action of a warm rain-douche, a hot full bath (104° F. for three to five minutes), a hot foot bath, or a fomentation to the spine or abdomen. Great care must be taken to avoid sweating and overheating. The heating process should not last more than from three to five minutes. If reaction is deficient, the patient may, for the first applications, stand in a hot foot bath of 104° F. during the application of the cold sheet. To prevent congestion of the lungs under a general cold application, the chest should be rubbed with the dry hand or the friction mitt until red, before the application is made. The attendant applies the hand, after dipping it in ice water, to the chest before and behind a few times with vigorous rubbing. The duration of the wet-sheet rubbing should be not more than thirty or forty seconds at first. The time may be gradually extended to two minutes. Two persons should be employed in administering the treatment, one to rub the legs, while the other is rubbing the arms and trunk. Great care should be taken to avoid chilling by evaporation, either before or after the rubbing. To prevent this the patient should be wrapped in a woolen blanket until everything is in readiness for the application of the wet sheet. Then as the woolen blanket is withdrawn, the wet sheet is applied (Figs. 2, 3, and 4), and the procedures described carried out with vigor and care.

4. The fourth procedure begins with the warm rain-douche, temperature 100° F., for one minute, while a hot spray, 110°–120° F., is applied to the legs for the same length of time. The application terminates with the cold rain-douche, 60° F., for ten seconds. The duration of the application should be gradually increased to thirty seconds. Immediately after the application the patient should be wrapped in a Turkish sheet and thoroughly rubbed by two attendants until reaction is well established. Complete reaction should be secured by wrapping in blankets for a few minutes, or by moderate exercise.

In the employment of general cold applications in cases of pulmonary tuberculosis it is necessary to observe with care certain precautions: —

1. A tonic cold application should never be made when the surface is cold, when a chill is impending, or when the patient feels chilly, nor when the temperature is high.

2. Cold applications should not be made to the entire surface at the same instant until the patient has been trained by carefully graduated, partial cold applications, in which the whole surface is gone over by applications to small territories in succession. The danger of pulmonary congestion from retrostasis is thus avoided. This is especially necessary in cases in which there is a hemorrhagic tendency. When the application is made to small areas in succession, as in the wet-hand rubbing (Fig. 5), cold mitten friction (Fig. 1), cold towel rub (Figs. 6, 7, 8), reaction is produced in each part before proceeding to the next. Thus the general retrostasis is avoided, and pulmonary congestion is not produced.

3. The intensity, duration, and frequency of applications must be accurately adapted not only to the patient's ability to react, but to his power to digest and assimilate, the aim being to stimulate constructive metabolism more than destructive change. A loss of weight indicates the necessity for rest from exercise, and diminished intensity, duration, or frequency of the cold application.

FIG. 7.— COLD WET TOWEL RUB TO ARM.

FIG. 6.— COLD WET TOWEL RUB TO CHEST.

4. In applications for the lowering of temperature, all the antithermic measures such as are used in typhoid fever and other infectious fevers, as the Brand bath, the cooling pack, can not be safely employed because of the intense internal congestion produced by these measures, and for the further reason that the resistance of the body and its heat-making capacity are greatly reduced, so that only mild measures are tolerated. The neutral bath, wet hand rub, wet towel rub, administered carefully, and at temperatures ranging from 85° to 92° F., are best suited to the purpose. The cooling head compress and the cold abdominal and the cool chest compress are also useful as a means of reducing fever.

5. Great care should be taken to avoid producing prolonged chill at any time, and especially in the beginning. Measures which produce retrostasis by causing contraction of the blood vessels of the entire cutaneous surface are not well tolerated except in the incipient stages of the disease.

6. The patient's weight, general strength, appetite, and temperature are matters which should be carefully studied in relation to the treatment. An increased loss of weight indicates the necessity for

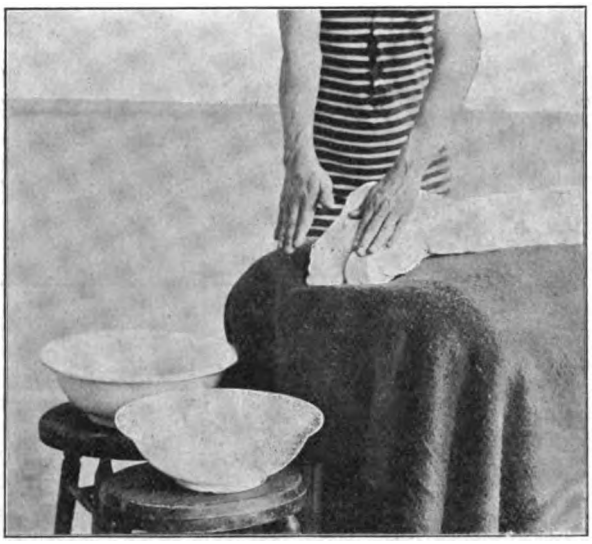

FIG 8.—COLD WET TOWEL RUB TO FEET.

rest, and decrease in the intensity, duration, or frequency of the treatment. Loss of appetite and of strength indicate the necessity for the adoption of the same measures. Fever interdicts short cold applications, and requires the application of prolonged tepid measures.

7. An aggravation of any of the patient's symptoms indicates a necessity for the modification of the treatment. A proper management of hydriatic treatment secures very prompt or almost immediate alleviation of symptoms. A contrary result is evidence for the need of a change.

8. By employment of these general principles we may confidently expect to secure some degree of alleviation of all the symptoms, even in the worst cases; in the average case, great improvement and a lengthening of life amounting to many months and sometimes several years; and in favorable cases, suppression of the fever and the night sweats, improvement in appetite and weight, and decided gradual lessening and final disappearance of the cough and expectoration, restoration of strength and general vigor, and, finally, disappearance of the bacilli and complete suppression of all symptoms. The patient should continue the treatment in a modified way after the disappearance of all the symptoms, not only for a few weeks, but for months, even years. In fact, the habitual employment of the daily cold bath may be regarded as one of the best of all safeguards for persons who have been cured of the disease by hydriatic measures. After having made use of most of the above-described measures for the last twenty-five years, and in a large number of cases, I feel no hesitation in saying that they are capable of accomplishing more for the radical cure of tuberculosis than any or all other known measures.

(To be concluded.)

Treatment of Colds.—W. Scheppegrell (*Medical News*, Oct. 13, 1900) calls attention to the fact that colds are not, as is generally believed, contracted by exposure, but, on the contrary, are due to the wearing of excessive clothing, poor ventilation, and overheating of houses.

For the prevention of coryza the writer recommends the cold shower bath, which should at first be taken at a temperature of 50° to 70°, according to the tolerance of the patient, immediately upon rising in the morning or succeeding the warm bath. This stimulates the normal action of the body, and accustoms it to reaction to cold, when the latter occurs in the form of exposure out of doors. The constitutional treatment of colds is of comparatively little value. A certain number are due to the uric-acid diathesis, and these are benefited by the free administration of lithia. A brisk saline cathartic, if taken within the first three or four hours, is one of the most useful remedies, and is devoid of unpleasant consequences. Quinine, which is commonly employed to abort a cold, is said to be of little value; at most, it only inhibits the unpleasant symptoms which accompany this condition without shortening its duration. Locally, cocain is sometimes employed, but it should never be used, because of the danger of contracting the cocain habit. Simple cleansing of the nose with normal salt solution at body temperature is free from unpleasant consequences, and if care is exercised to avoid blowing the nose and to introduce the fluid with slight pressure, there is very little danger of its entering the Eustachian tube.

TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

HYDRIATIC MEASURES AND CALISTHENICS IN THE TREATMENT OF HYSTERIA AND NEURASTHENIA.

OCTOBER *Medicine* has an original article by B. C. Loveland, M. D , of Syracuse, N. Y., on "Some General Considerations in the Treatment of Hysteria and Neurasthenia." In this valuable article the writer lays considerable stress on the employment of hydriatic measures and calisthenics in the treatment of these disorders. Upon the points we quote from the article as follows: —

"In hydrotherapeutics and calisthenics we have powerful agents in the way of equalizers of the circulation, aids to nutrition, and nerve tonics. So simple a procedure as a quick cool sponge bath on rising in the morning, rubbing dry quickly, and following by calisthenic exercise, will often yield most satisfactory and sometimes remarkable results. Both the temperature and time of the sponge bath, and the number and variety of calisthenic movements should be prescribed by the physician. The bath should not be too cool at first. If the patient has been used only to hot or warm water, it can gradually be reduced, a degree each day, until the patient will react and feel good after the use of water between 70° and 80°. Hot bathing should be stopped, even though the patient insists that it is comfortable, except for cleanliness, which will not be oftener than once a week. In exercises I am accustomed to prescribe flexion and extension of the arms and legs while standing, bending forward and backward, bending sidewise, first one side, then the other, sitting (squatting) down and rising up, and finally respiratory movements, deep and forcible, usually starting the patient with three to five each week, increasing one each every third day, until fifteen or more of each are taken. Of course, in different cases different movements suggest themselves as the patient may present developmental deficiencies. It will frequently be necessary at first to outline a course of exercises to illustrate the movements, or have a nurse who has been instructed supervise them for a time. When a patient is unable to stand for the exercises, it may be necessary at first to outline a course of exercise that may be taken in bed. A hot foot bath, of 110° for twenty to thirty minutes at bedtime, will in many cases induce sleep. In others a massage may be ordered, where obtainable, or a hot and cold application to the spine, as follows: Have the patient disrobe and sit on the edge of the bath tub, first having provided a pail or basin of water at 106° to 110°, and another at 60° to 75°, a large sponge, and a small dipper. Then dip the sponge in hot water and squeeze it out on the nape of the neck, repeating this three times. This is to be followed by pouring two or three dipperfuls of the cold water over the same territory, and afterward rubbing dry quickly, then going to bed. This will act as a tonic and a great aid to sleep in some cases.

"Other hydrotherapeutic treatments might be employed with great advantage, especially the spinal douche when used at proper temperature and pressure, as also could electricity in some of its forms, the faradic being most useful to the general practitioner on account of its portability."

Diuretic Effects of Sodium Chloride Solution.— W. H. Thompson, M. D., F. R. C. S. (*Journal of Physiology*, Vol. XXV, No. 6), from the results of elaborate experiments carried on for the purpose of determining the diuretic effects of small quantities of so-called normal (physiological) salt solutions when injected *intra venam*, arrived at the following conclusions: —

"In many cases a small intravenous injection of 'physiological' or 'isotonic' solution of sodium chloride may bring about a diuresis out of all proportion to the quantity of solution injected.

"The pronounced diuretic effect begins to appear toward the end of the first hour after the injection, and reaches its maximum in the first half of the second hour. It then gradually declines throughout the third and fourth hours, at the end of which time the secretion has, as a rule, become normal.

"The excretion of nitrogen and urea is considerably augmented. The increase, however, reaches its maximum in the first

hour after the injection, and thus does not coincide with the maximum outflow of urine.

"The diuresis is not caused by an elevation of blood pressure. On the contrary, a fall of pressure often takes place during the hour of greatest secretion of urine. The fall is probably to be attributed, in part, at all events, to the great escape of water through the kidney. It is most marked in experiments where the diuresis is greatest.

"The commencement of renal activity is accompanied by a hydremic condition of the blood, which no doubt plays an important rôle in causing the diuresis. It is not, however, the sole factor, since the maximum of the hydremic state does not correspond with that of diuretic effect; moreover, the hydremia has ceased to exist long before the activity of the kidney has returned to normal. Further, a hydremic condition does not always occasion diuresis.

"The chlorides of urine are as a rule considerably reduced, but the diminution does not run parallel to the activity of the kidney. It is probably an after effect of the anesthetic.

"The volume of the kidney as measured by the oncometer corresponds in a general way to the rate of outflow of urine. No large augmentation or diminution of the latter probably can occur without a more or less parallel alteration in the size of the organ. The correspondence is, however, by no means invariable; deviations between the two factors not infrequently arise, an increase in volume being accompanied by a diminished flow, and *vice versa*.

"These deviations are probably to be explained on the assumption that the interchange between the epithelial cells of the tubules and the blood takes place through the medium of the lymph, and that the amount of this fluid within the spaces of the organ, which at times must be very considerable, need not necessarily correspond with the volume of blood for the moment flowing through it.

"The results observed fit in more readily with the theory of Bowman concerning the mechanism of urinary secretion than with that of Ludwig."

Cold Baths in Typhoid Fever in Children.— A. D. Blackader, in the *Archives of Pediatrics* for September, 1900, has had an opportunity of studying several epidemics of typhoid fever in children that occurred in Montreal; they were due to the dissemination of infection in milk. The cases included twenty-nine in his private practice, twenty-eight in the Montreal General, and twenty-three in the Royal Victoria Hospitals. The treatment in the majority of these cases was the regular systematic employment of cold baths. In fifty-three cases the bath was employed whenever the temperature rose above 102°. In nineteen instances the first few baths were given at 90° F. reduced to 85°, and afterward continued at 85° F. Their duration was ten minutes, and they were repeated every three hours, and in three instances the cold pack was employed.

The writer is convinced of the great value of the systematic employment of the cool or cold bath in typhoid. The Brand rule of using the bath when the temperature reaches 102.4° should not be adhered to rigidly, and a marked fall in the temperature as a result of the bath is not to be desired. Rapid falls are almost invariably followed by an equally rapid rise. Baths are to be employed, not for their action on the temperature alone, but for their stimulating action upon the heart, respiration, and secretions, especially those of the kidneys. The nervous system of the child responds more readily to the cold bath than does that of the adult, and the amount of response is in some respects in inverse ratio to the age. The bath should not have a temperature for children as low as that which is employed for adults. The duration of the bath, its temperature, and the frequency with which it is employed should be modified to suit each case; all sudden and severe shocks should be avoided. It is a great shock to a young child to plunge it at the outset into a bath of 68° or even 75° F., while a bath of 90° F. cooled to 85°, repeated regularly for the first few days of the attack, gives rise to neither resistance nor signs of collapse on the part of the child. Later on in the disease, lower temperatures may be employed if found necessary. Even if the pyrexia falls below 102° F. the regular use of the cool bath once or twice a day strengthens the heart action and tends to a rapid convalescence.— *Medicine, December, 1900.*

Differential Diagnosis between Tuberculous and Nontuberculous Fistulæ.— S. C. Grant (*Medical Record*, July 7, 1900) summarizes the points of difference in the affections as follows: —

NONTUBERCULOUS.	TUBERCULOUS.
1. Internal and external openings small and round, the edges red, and situated in the center of an elevation.	1. External and internal openings large and triangular, edges of a bluish tint and drooping into the opening.
2. Buttock rounded and supported by fat.	2. Skin undermined.
3. Hair about the buttocks normal.	3. Abundant, long, and silky.
4. Nails normal.	4. Nails clubbed.
5. Face and ears and nose normal.	5. Face pinched, nostrils wide open, ears large and standing out prominently from the head.
6. Voice natural.	6. Voice husky.
7. Complexion ruddy.	7. Complexion sallow.
8. Rarely loss of flesh.	8. Loss of flesh considerable and rapid.
9. Discharge slight and yellow.	9. Discharge profuse, whitish in color, and watery.
10. Introduction of probe causes considerable pain.	10. Introduction of probe causes slight pain.
11. Appetite normal.	11. Appetite poor.
12. Digestion good.	12. Digestion poor.
13. Sleep natural.	13. Sleep interrupted, and occasionally disturbed by night sweats.
14. Discharge contains principally colon bacilli.	14. Discharge contains tubercle bacilli.
15. Not accompanied by hemoptysis or cough.	15. Frequently complicated by hemorrhage of the lungs and annoying cough.
16. Tight sphincter.	16. Patulous anus.

The Value of Rest in Bed in the Treatment of Certain Digestive Disorders.— Albu (*Zeitschrift für Krankenpflege*, October, 1900) calls attention to the frequency with which neurasthenia, anemia, and malnutrition are associated, and to the injury liable to come to the system through these disorders. The lack of nerve energy, resulting in imperfect innervation of the tissues, leads to a lack of muscular tone, which manifests itself in different ways according to the part affected. In the abdomen, visceroptosis with its accompanying evils is an expression of the generally debilitated condition of the system.

When such conditions are present, Albu recommends rest and feeding; but in order to obtain the most satisfactory results the patient must make a complete change in his habits of life. As a routine for such cases at least three weeks of absolute rest in bed, in some institution away from home, is to be advised, together with a full diet. By these means bodily waste of all sorts, nerve and muscle, is reduced to a minimum, and the depleted cells are enabled to regain their normal tone and vigor.— *Medical Record, Dec. 15, 1900.*

The Prevention and Treatment of Postpartum Hemorrhage.— J. W. Byers (Dublin *Journal of Medical Science*, October, 1900) describes the various causes leading to this accident, and says that the two measures which should be adopted in every case to prevent postpartum hemorrhage are: (1) The proper management of the third stage of labor; (2) the important principle never to deliver in the absence of pains. Treatment consists of the following measures, mentioned according to the writer's idea of their relative importance: External uterine massage and hot water through a double-current tube, hand in the uterus, bimanual compression, gauze plugging of the uterus, drawing the organ downward by means of a vulsellum forceps passed through the lips of the cervix ("kinking" and compressing the uterine arteries), and injection of iron. The latter is a remedy not without danger; it causes a certain amount of superficial injury to the uterine wall, which forms a suitable nidus for the growth of germs, and if it fails, plugging can not be done, owing to the effect the iron has on the tissues.— *Medical Record, Nov. 3, 1900.*

Surgical Hints.— In burns about the neighborhood of the joints, keep the limb flexed if the burn is on the extensor side, and extended if the flexor side is affected.

In burns of the face where the nose is badly affected, it is often a good idea to pass pieces of rubber drainage tubing up the nostrils in order to prevent closure during cicatrization.

In phlegmonous inflammation of the phalanx it is well to cut down to the bone, but if the middle or first phalanx is affected, it is better surgery to avoid going through the sheath of the tendon.

If you can help it, do not operate on a man who is drunk, especially if he appears to be a habitual drunkard. Drunkenness certainly seems to favor the occurrence of sepsis, owing to diminished resistance of the tissues, and shock occurs very readily. Besides this, delirium tremens may come on to complicate matters.— *International Journal of Surgery.*

Insanity among the Troops in the Philippines.— In his annual report to the Secretary of War, Surgeon-General Sternberg says, regarding insanity among the troops: "In the army regulars and volunteers during the calendar years of 1898 and 1899, there were reported on the monthly reports of sick and wounded, 347 cases of insanity, and 202 of these cases, or 58.2 per cent, were committed to the government hospital for the insane. One hundred and thirty-five cases, or 66.7 per cent of the commitments, recovered in an average period of 3.9 months, 13 were improved, 6 died, and 48 remained unimproved. Ninety-six of the 347 cases were reported on the monthly reports of troops serving in the Pacific islands, and 32 of these, or 33.3 per cent, were sent to the government hospital for the insane. Seventeen cases, or 53 1 per cent of those committed, recovered in an average of 3.6 months, 2 were improved, 2 died, and 11 remained unimproved."— *Medical Record, Nov. 3, 1900.*

Treatment of Eczema by Red Solar Light.— The favorable results which Finsen has obtained in variola by the action of the red rays of the solar spectrum have stimulated W. Winternitz (*Sem. Med.*, Aug. 15, 1900) to experiment with an analogous treatment in subjects with eczematous lesions. In these attempts the eruptive regions, previously covered with thin silk stuff of an intense red color, were exposed directly to the solar light as long as possible (even as long as four hours in one case). In all the patients treated in this way, whatever the form of eczema that was present, Winternitz noted a rapid disappearance of the symptoms. The serious oozing, the cutaneous hyperemia, and the inflammatory infiltration were diminished, then disappeared completely.— *Medical News, Nov. 10, 1900.*

Physiology and Pathology of Bile Secretion.— Albu (*Berliner Klinische Wochenschrift*, Oct. 1, 1900) reports certain observations made in the case of a woman with biliary fistula. The latter had existed for nine years. Various diets were taken, and it was found that one of milk, eggs, soup, white bread, vegetables, and fruit caused a more abundant outflow of bile than a diet in which meat figured largely. The writer thinks that it is not possible to determine from experiments on animals just what remedies will in man produce an increased bile flow, and thinks that many investigators have mistaken an outflow of bile from accumulations in the various biliary reservoirs for an actual increase in its formation in the liver cell. — *Medical Record, Nov. 30, 1900.*

Massage in the Treatment of Nocturnal Enuresis.— Dr. I. Hershmann (*Medicinische Woch.*, Sept. 24, 1900) recommends massage of the neck of the bladder by way of the rectum for nocturnal enuresis. The index finger is used, and massage is practiced, at first mildly, later more energetically, for two minutes at each session. His results have been excellent. The writer believes that the condition is brought about by some defect in the co-ordination of the function of the nerve elements of the vesical sphincter, which is permanently relieved by massage.— *New York Medical Journal, Oct. 20, 1900.*

A Congress for the Study of Cancer.— On the first Tuesday in May, 1901, there will be held in Chicago a congress for the study of cancer. The following subjects will be discussed: (1) What Are the Most Successful Methods of Treatment? (2) What Are the Values of Antitoxins? (3) What Is the Cause or Causes of Cancer? (4) Why Is Cancer on the Increase? (5) Classification of the Varieties of Cancer and the Most Important Advances Made in the Study of Their Pathology.

A Falling Birth-Rate in Berlin.— It is not in France only that the birth-rate is declining, for some recently published official statistics show a continuous decrease in the Berlin birth-rate, which is

now only 29 in 1,000. The number of children born during the period covered by the statistics was 450,000, which, if the birth-rate had been the same as in the whole of Prussia, would be 700,000.— *Medical Record, Nov. 3, 1900.*

Increase of Syphilis in Asia Minor. — Syphilis has for a considerable time been increasing in certain provinces of Asia Minor, and has become so diffused that according to official reports, eighty per cent of the inhabitants are affected with it, and the government has now ordered the adoption of measures intended to check the spread of the disease. Every year the Turkish government selects for military service, 12,000 men out of 20,000 in each vilayet, but in the vilayets where syphilis prevails, the requisite 12,000 efficient recruits can be obtained only by selection from among 30,000 men, the remaining 18,000 being unfit for service. The provinces where syphilis has gained such a hold are Castamoni, Bartin, Erzingian, Angora, Ismid (Nicomedia), and Adana, the last of which was added to the list only a few days ago. This prevalence of syphilis in these regions dates from the Russian occupation of Constantinople in 1830, when a force of 30,000 Russian soldiers was landed near Beicos on the Asiatic coast of the Bosporus. It is the Moslem population who suffer most severely from the disease, for they consider an examination by a medical practitioner to be an offense against morality, especially if the patient happens to be a woman. — *The Lancet, Nov. 24, 1900.*

Raw-Meat Cure of Tuberculosis. — An institution was opened a few months ago in Belgium for the purpose of carrying out Richet's alleged "cure" for tuberculosis by an exclusive raw-meat diet. After a trial of not more than three months, the experiment has been abandoned, those in charge of the hospital asserting that there was no efficacy whatever in the method.— *Medical Record, Nov. 3, 1900.*

Diuretic Effects of Grapes.— Dr. Pecholier, of Montpelier (*Dietetic and Hygienic Gazette*), calls attention to the diuretic action of fresh grapes. In two cases — one a patient with cardiac disease, and the other with hepatic cirrhosis accompanied by ascites — the "grape cure" was used with excellent results. In the first case five pounds of grapes were eaten daily, and the diuretic effects produced were much more satisfactory than when milk, digitalis, or iodide of potassium were used.

Ice Applied to the Base of the Brain for the Relief of Nausea.— According to a writer in *Modern Medical Science*, ice applied to the base of the brain is an effective means of relieving the nausea which so commonly occurs in sick-headache, bilious colic, cholera morbus, and other disorders in which nausea is a common symptom.

Increase of Tuberculosis in Norway.—Hansen, in a recent lecture before the Storthing, at Christiania, on the cause of tuberculosis and the fight against it, stated that in 1896, 54.5 per cent of all deaths between fifteen and thirty years of age were caused by tuberculosis, and that every year about seven thousand of the inhabitants of Norway die of this disease. During Hansen's thirty years' experience, tuberculosis has increased eighty per cent in the Bergen district.

The Value of Saline Baths in Disturbances of the Menopause.— Gottschalk (*Sem. Med.*; *Br. Gynecol. Jour.*, August, 1900) advocates the use of hot saline baths at a temperature of 40° C., lasting for about twenty minutes, to be taken every evening at bedtime, as an excellent means of combating the night attacks of heat and sweating from which so many women suffer at the time of the menopause.

Improved Culture Medium for Gonococcus.— Sée (*Annales Dermatologie*, July) gives the following formula for an improved culture medium for gonococcus: Tubes of gelose are melted, and cooled to 40° C. Half the volume of blood — drawn directly from the artery of a rabbit — is added to the tubes of gelose, which are cooled in a slanting position. The growth of the gonococcus in this medium is very rapid, characteristic colonies being present in twenty-four hours.

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

A New Bacillus from Vaccine Lymph.— Nakanishi (*Centralbl. f. Bakt.*, Bd. XXVII, No. 18) describes a bacillus which he finds constantly present in vaccinia pustules, and which he has experimentally investigated. This is present in the epithelial cells of the "vaccine pulp" of calves, either as a rod-shaped form staining in a bipolar fashion, or as a spherical or oval form taking the stain less perfectly. In the lymph from children, on the other hand, the rod-form is not found, but large, round, refractive organisms are present similar to those found in calf lymph, which are looked upon by the writer as variation forms of the bacillus. Pure cultures of the bacillus were obtained on agar plates both from the calf lymph and from lymph drawn from seven-days-old vesicles on the arms of children. The organism grows best on solidified blood-serum, and resembles, morphologically, the diphtheria and the so called pseudo-diphtheria bacilli; it is a facultative anaerobe. The younger forms are wedge or "candle-flame" shaped; others are rod shaped, and in old cultures, club-shaped and rounded forms are common. Experimental inoculations in calves and guinea pigs were negative. In rabbits, intraperitoneal inoculations were also negative in result, but ulceration is produced by inoculation of the cornea, and in the epithelial cells of this, round or oval bodies are found. These are identical with the bodies described by Guianieri and Pfeiffer in the corneal tissue inoculated with vaccine lymph, and in the corneal vesicles in variola, and which were considered by them to be probably protozoa. By inoculation of cultures of the bacillus into the arms of several children, a student, and himself, the writer was successful in producing typical vesicles. Two other students gave no reaction; possibly they were immune. He argues that the described bacillus is in all probability the specific agent in vaccinia, but with regard to the round and oval forms found in the corneal epithelium he hesitates to decide whether they are really varieties of the bacillus so modified by the unfavorable site on which they are growing, or whether they are degeneration foci in the epithelial cells themselves. The fact that somewhat similar shapes are found in old cultures seems to give countenance to the first view. Much evidence has been collected to show that the protozoa of Guianieri, the so-called *cytorrycytes variolæ*, are characteristic and specific, and as the writer has produced identical forms by inoculation of cultures of this bacillus, he deduces that the bacillus is characteristic of smallpox lymph, and in all probability the exciting factor in smallpox itself. Further, as the organism resembles the diphtheria bacillus, he draws a parallel between this disease and variola clinically and pathologically, and finds close analogies.— *British Medical Journal, October 20.*

A New Pathogenic Mold.— W. H. Ophuls and H. C. Moffitt, in the Philadelphia *Medical Journal* of June 20, 1900, present a preliminary report of a new pathogenic mold which was formerly described as a protozoon under the name *coccidioides immitis pyogenes*. The patient from whom the organism was obtained was a farm laborer aged nineteen, whose sickness began eleven weeks before admission to the hospital, with a chill. After a few days the left pleura was tapped and a large quantity of clear fluid was removed. The patient has an irregular fever, the temperature at times reaching 104°. The Diazo reaction was present, but not the Widal. About four weeks after the onset of his trouble, painful inflammation of the knees, elbows, wrists, and ankles developed. Later there was a fluctuating swelling over the left eye, and a large gland developed in the supraclavicular fossa. There was cough, with mucopurulent and occasionally blood-stained sputum. There were no tubercle bacilli in the sputum. The lungs were irregularly consolidated. There was bronchial breathing and harsh and dry râles. The heart was enlarged, but otherwise normal. The leucocyte count was seventeen thousand. The patient died ten days after admission, about twelve weeks after the onset of the disease. The au-

topsy showed acute bronchial pneumonia, abscesses of the retroperitoneal lymph glands, and encapsulated empyema, enlarged and softened spleen, with colloid swelling of the liver and kidneys.

In all the diseased parts that were examined there were found peculiar parasitic organisms, which, in the few recorded cases, have been described as protozoa. The life history of these parasites shows the youngest forms as small spherical masses of protoplasm enveloped in a membrane. The protoplasm is granular, and stains well, and is occasionally vacuolated. The organism sometimes attains a diameter of thirty micromillimeters, and is always perfectly spherical. When the adult stage is reached, the capsule breaks, and one hundred or more sporelike bodies are detached. Locomotion was never observed in the adult forms nor in the spores. The close resemblance of these spores to coccidia led to their classification as protozoa. The lesions produced by their presence in the human body are chronic suppurating processes. The organism, grown upon agar-agar, showed no mycelia. Inoculated into guinea pigs, it caused suppurating foci, and the same mold was recovered as had been noted in the patient. The organism was found to develop mycelia, when free in a culture medium such as a hanging-drop of bouillon.— *Medicine, October, 1900.*

The Viability of the Plague Bacillus.— In a preliminary note issued in the Public Health Reports of the United States Marine Hospital Service, Dr. Rosenau places on record the results of some experiments upon the length of time for which the plague bacillus retains its vitality. The method employed consisted in keeping various materials infected with this bacillus under varying conditions of light, temperature, and moisture. The organism was obtained from five different sources — one from Jeddah, one from Oporto, one from Rio de Janeiro, one from Bombay, and the fifth from the New York quarantine case. The bacillus retained its vitality and virulence (for mice) for seventy-five days on small balls of absorbent cotton soaked in a few drops of a gelatin culture mixed with egg albumin, when these balls were kept in a dark room or cool incubator at about 20° C. and not exposed to the influence of other contaminating organisms, though desiccation was not materially retarded. On other material exposed to higher temperature (27° C. or over), vitality was lost in a period not exceeding a fortnight. The other materials infected were small squares of fabric, chips of pine wood, and pieces of paper. No experiments in which mixed infection played a part are recorded, so that natural conditions were apparently not reproduced. Appended to the account of these investigations is a summary of the results of other experimenters who have worked on the same lines, and it is evident from this that the plague bacillus can not withstand desiccation at temperatures approaching 30° C. Dr. Rosenau has been more successful than any other investigator in keeping the organism alive for seventy-five days, but the conditions of the experiment were such that complete desiccation was not obtained. The practical bearing of experiments in which pure cultures are used, and in which mixed infection plays no part, is small, and bacteriologists and hygienists in general are still waiting for an exhaustive series of investigations into the viability of this bacillus under circumstances which shall more faithfully reproduce the environment and conditions of plague-infected material as met with in its endemic home.— *British Medical Journal, Nov. 3, 1900.*

A Simple Method of Distinguishing the Colonies of Typhoid Bacilli from the Colon Bacillus.— Dr. J. A. Case (Philadelphia *Medical Journal;* Indiana *Lancet*) describes a specially prepared culture medium recommended by Piorkoski. This is made by taking 100 parts of urine that has undergone ammoniacal fermentation, to which is added 0.5 parts of peptone and 3.3 parts gelatin. The whole is heated over a water-bath for one hour, then filtered, placed in test tubes, and sterilized in the usual manner. The sterilization is repeated for ten minutes on the following day.

To make the test, the stool of a patient is first rubbed up in a mortar, and three tubes taken, which are inoculated as follows: The first tube by the contents of two platinum loops; the second tube is inoculated from the first, using four loops, and the third by six or eight loops from the second dilution. The contents of

each tube is then poured into Petri dishes and placed in a cool place until the gelatin is solidified; it is then placed in an oven and kept at a temperature of 22° C. for twenty-four hours. At the end of this time the typhoid colonies are seen as transparent, filamentous bodies, alongside of the coli colonies, which are rounded with well-defined edges. According to the writer, Piorkoski claims to have found the typhoid colonies as early as three days after the beginning of the illness, and he furthermore claims that they may be demonstrated in every case. Twenty-six cases have been tested, in all of which the results of the test were confirmed by the subsequent clinical history. —*Cincinnati Lancet-Clinic.*

The Bacterial Flora of the Lungs of Man and Animals.— Dr. L. Beco (*Arch. d. Med.*, Exp. XI, p. 317; ref. *Schmidt's Jahrb.*) says that in animals the lung is free from bacteria; it exceptionally contains the diplococcus of Talamon Fraenkel. The bacteria of the upper air passages remain limited to these areas after death; they do not spread to the lower air passages. If, however, the lung contains bacteria at the time of death, then the bacteria may subsequently spread to neighboring organs. This occurs very rapidly in the case of saprophytes, and slowly with the pathogenic bacteria. Between these two varieties there are facultative saprophytes the presence of which in the blood of the heart is but the result of post-mortem migration.

In man the lower air passages may be sterile. It is not uncommon, however, to find pathogenic bacteria in otherwise healthy lungs, chiefly such as are looked upon as exciters of different forms of broncho-pneumonic affections; namely, pneumococci, streptococci, and more rarely staphylococci. It is probable that toward the end of life, during the agony, and corresponding to its duration, an extension of the bacterial flora from the upper air passages to the finest bronchial terminations occurs. Under normal conditions such an extension does not occur after death; indeed, even a diminution in the number of bacteria may occur post-mortem. Examination of eleven cases showed that the tubercle bacillus does not occur in the healthy lung.

Bacteriotherapy in Inoperable Malignant Tumors.— Dr. Filippo Scuderi (in *Gazzetta Medica Lombardi*, June 10, 1900) reviews the experience of recent observers with erysipelas toxin in the treatment of inoperable malignant growths. He collected statistics concerning 115 cases so treated. Of these, 62 were sarcomas and 53 carcinomas. Of the 62 sarcomas, 11 were completely cured (Kleeblatt, 1; Mynter, 1; Coley, 9); in other words, 17.74 per cent. Twenty-eight cases were considerably improved (Spronk, 8; Friedrich, 1; Coley, 19), or 45.16 per cent. The other 23 cases showed a temporary improvement, or failed to respond to the toxin. Of the 53 carcinomas, 22, or 41.5 per cent, showed some temporary improvement, and the rest (31 cases) gave completely negative results.

In conclusion, the writer says that the benefits of erysipelas toxin are now sufficiently well demonstrated to warrant its use whenever indicated. The percentage of cures (17.74 per cent) in sarcomas is certainly encouraging. Coley's work in this country receives prominent mention in this article.—*N. Y. Med. Jour., July 14, 1900.*

Bacteria in the Arctic Regions.— Some interesting facts concerning the freedom of the air, water, and even the intestinal contents of animals of Arctic regions from bacteria are communicated by Dr. Levin, of Stockholm (*Annales de l' Institut Pasteur*, July 1, 1899, p. 558), who took part in the Natthorst expedition during the summer of 1898. Working each time with 20,000 liters of air, he found practically no bacteria. Sea water, snow, and ice yielded on an average one bacterium per 11 c.c. In twelve samples of brown mud he found only a single bacterium. The intestinal contents of polar bears, seals, eider ducks and other birds, sharks, sea urchins, anemones, and crabs were nearly always sterile Not only did he obtain no growths, but he was unable to find evidence of the presence of bacteria after staining the intestinal contents with the usual agents. These results confirm the conclusions of Nencki, Nuttall, and Thierfelder concerning the presence of bacteria as a non-essential factor in digestion. — *American Journal of the Medical Sciences, April, 1900.*

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WATER DRINKING.

WATER drinking as a therapeutic measure is of very ancient origin. Hippocrates prescribed it as a remedy in fevers, and the drinking of cold water has been practiced among the Egyptians from the most ancient time in the treatment of fevers. Cold water drinking was used by Hahn in the treatment of fevers in Germany in the first half of the eighteenth century, fully sixty years before Priessnitz prescribed the internal use of water in such prodigious quantities at Graefenberg.

Todano, an Italian contemporary of Hahn, made his fever patients drink five pints of ice water every three hours. The patient was placed in a hammock without covering, and the treatment was continued until perspiration occurred. If he became comatose, ice was placed over the heart. This extraordinarily vigorous refrigerative treatment must have sometimes produced most undesirable results, and it is these excesses in the use of an efficient and valuable remedy which are doubtless to a great degree responsible for the slowness with which the merit of water drinking as a systematic procedure has acquired recognition and appreciation.

Sir John Chardin, a French traveler in Persia, relates how that in May, 1674, he was treated by a native Persian physician for a very grave intermittent, or "fever of Bender." One of the most important measures to which he was subjected was the drinking of large quantities of water cooled with snow.

Currie also recommended water drinking in the treatment of fever as follows: "While the different modes of applying water to the surface are employed, it ought also to be poured into the stomach in large quantities when the patient's heat will permit it, and the presence of nausea and vomiting are no objections to this practice."

The importance of water to the vital economy must be recognized when we remember that the living organisms which compose the human body, as well as those of all other animals, are submerged in water.

Bernard, the great French physiologist, sagaciously remarked concerning the aquatic life of man, "Life exists only in a liquid medium. It is only by certain artifices of construction that the organisms of man, as those of other animals, can live in the air; but all the active cells upon which their functions depend, live, without exception, like the infusoria, in an interior liquid medium."

Water drinking is an internal bath; it dilutes the fluids of the body in which the cells and fibers are bathed; it purifies the body by diluting the medium in which it lives. By the free use of water the movement of the mass of liquid in which the living elements of the human body perform their work, is quickened, and the stream of life runs clear and pure. It has been shown that water is absorbed from the stomach very slowly. This takes place chiefly in the intestine. Absorption is stimulated, however, by the presence of CO_2. Distilled water charged with CO_2 is the best of all drinks as a beverage for use in connection with hydrotherapy. It is soothing to the stomach, and is rapidly absorbed; hence more readily quenches thirst. The presence of mineral salts of any kind lessens the rate of absorption.

Schultz has shown that copious water drinking increases the proportion of water

in the blood nearly six per cent; but Böcker has shown that this increase lasts only a short time, not more than fifteen to twenty minutes. Half an hour later the blood is thicker than before, and contains a smaller proportion of water than when water has been wholly withheld for twenty-four hours. Another effect upon the blood noted by Böcker was that blood clots formed after copious water drinking contain a smaller number of damaged corpuscles, which indicate their incapacity to absorb oxygen by not turning red when exposed to the air,— an evidence of the great value of water drinking as a means of improving the quality of the blood through bettering its constituents as well as by elimination of waste matters through assisting their solution.

To the great thinning of the blood which follows copious water drinking is due the remarkably increased activity of the kidneys, skin, and bowels which it produces. Examination of the urine shows not only that the quantity is increased by water drinking, but that the urea and other solid constituents are also increased. Fleming, in experiments for the purpose of determining the physiological effects of the Turkish bath, showed that the perspiration produced in profuse sweating after copious water drinking contains a larger per cent of chloride of sodium than does the urine. An increase in the amount of urea and other nitrogenous principles (1.55 per cent) was also noted.

Baron Liebig showed long ago (and his observations have been many times confirmed) that water drinking powerfully influences metabolism, increasing both assimilation and disintegration, but especially the former.

Water is a medium by which nutritive material is conveyed to the tissues and waste matters conveyed out of the body. Thus it is evident that by increasing the amount of water introduced into the body, the movement of the vital fluids, the blood and lymph, may be accelerated almost at will. By the increase in the volume of blood, the blood pressure is raised, the heart movements become more energetic, and the functions of the glands and other forms of activity are increased. This is true of the secreting glands as well as of the kidneys and other excreting glandular organs. Increased movement of blood through the lungs secures greater absorption of oxygen by which the various metabolic and catabolic processes are facilitated; retrograde metamorphosis is more completely accomplished; uric acid, urates, oxalates, and other products of imperfect oxidation are diminished or made to disappear entirely; in short, the patient lives a more highly vitalized and functionally active life.

Therapeutic Applications.— The effect upon the blood of copious water drinking suggests it as a valuable measure in cases of dropsy, whether general or local in character, especially the latter. The increase in the specific gravity of the blood due to the rapid withdrawal of water by the kidneys and the skin, even to the extent of impoverishing the blood, prepares the way for the absorption of the dropsical fluid; and by a repetition of this measure from day to day, most remarkable therapeutic results may sometimes be obtained. Distilled water charged with carbonic acid gas should be employed, without the addition of sugar or any other substance, unless it be fruit juices of some sort. The dose should be from one to two pints, and should be taken preferably before breakfast or an hour or so before dinner. The writer well remembers a case with which he became acquainted while in Bellevue Hospital nearly twenty-five years ago, under the late Dr. Austin Flint. A patient under treatment for general dropsy from organic disease of the heart, which had proved so refractory to all measures which had been employed, including

diuretics of all sorts, was finally given up as a hopeless one, and the patient was permitted to drink copiously of water, which had previously been denied or allowed only in very stinted quantities. She drank in the course of the day two or three quarts of water. As a result, profuse diuresis occurred, the dropsy disappeared, and the patient made, for the time being at least, a very good recovery, and was soon able to leave the Hospital.

Profiting by this experience, the writer has made use of this measure in many cases of dropsy, with most gratifying results, and has never found it necessary to require dropsical patients to refrain from drinking water freely. It should be taken *in large quantities and rapidly.* When practiced for the purpose of carrying off the dropsical effusion, the water drinking should be confined to two periods daily, morning and evening, no fluid whatever being taken between these hours.

When it is desired to increase the volume of the blood and to introduce permanently a larger proportion of water, the water drinking should be managed in quite a different manner. A small quantity should be taken at frequent intervals, and the amount in the course of a day may sum up to several pints; but the quantity taken at any one time should not exceed four to six ounces. This quantity may be taken every hour or hour and a half with advantage.

When the amount of water supplied to the body is insufficient, the condition of the body becomes in some degree comparable to that of a stagnant pool; while an abundant supply of liquid so encourages its activities that it may not inaptly be compared to the flowing mountain stream.

Cold Water Drinking.— Priessnitz required his patients to drink large quantities of water, many patients taking as high as twenty to forty glasses a day. It is curious to note that at the time when this empiric was requiring his patients to swallow such prodigious quantities of water, he had a rival, an old schoolmate, by the name of Schrott, living in a little village four miles from Graefenberg, who required his patients to abstain wholly from water for five to eight days at a time.

Water is not a mere mechanical conveyer of poisons out and of foods in; it is a powerful vital stimulant, a divinely appointed agent which the *vis medicatrix naturæ* can use in her healing work. Dietl, the famous pupil of a world-renowned master, Rokitansky, writing as long ago as 1845, uttered the following wise and philosophical words, which every physician who undertakes to rely upon the virtues of water and other physiological agents in dealing with human maladies should accept as a confession of faith: —

"Nature alone can cure; this is the highest law of practical medicine, and the one to which we must adhere. . . . Nature creates and maintains; she must therefore be able to cure."

The deluging practice of Priessnitz is still recommended by the German water-cure empirics and by some scientific hydrotherapists, but cases are certainly very rare in which such quantities of cold water can be swallowed with advantage. As a measure of treatment, water drinking may be practiced to the extent of six or eight or even ten glasses a day with advantage, when required, but not infrequently three or four glasses are sufficient, and there are cases in which it is more important to interdict the use of liquids by the stomach than to commend their use. In such cases water may be introduced by the enema in small quantity, to be retained.

Cold water drinking is especially indicated in all the cachexias and diatheses. In rheumatism it is useful as a means of diluting the blood so that it can dissolve and carry out of the body a larger amount of uric acid and allied substances; and as a means for encouraging activity of the

skin and kidneys, it is always useful in this disease.

In obesity, water drinking is essential as a means of dissolving and carrying out of the body the large amount of broken-down material which results from the increase in tissue destruction set up by exercise, hot and cold baths, and other means employed to reduce weight. To forbid the free use of water in obesity is a grave error.

In diabetes the free use of water is not injurious, but advantageous. The blood contains an excess of sugar. All the sugar that is not oxidized must be removed from the body by the kidneys and skin, chiefly by the former. The specific gravity of the urine in these cases is always high, indicating a similarly high specific gravity of the blood. It is evident, then, that water is needed in cases of this sort for the purpose of maintaining a proper degree of fluidity of the blood and for facilitating the removal of the unused sugar, the presence of which interferes more or less seriously with the various vital functions. While the free use of water in diabetes will of course have the effect to increase the quantity of urine daily discharged, the amount of sugar, which is a matter of most serious importance in this disease, is not increased. Indeed the amount of sugar has appeared to be somewhat decreased, doubtless as the result of the increased oxidation which takes place within the body under the influence of free water drinking.

In fevers, water drinking is essential as a means of aiding the kidneys and the skin in the elimination of the toxins to which the rise of temperature is due, in aiding the liver in its work of destroying the fever poisons, oxidizing leucomains, and promoting the reduction of temperature by securing an increased evaporation from the skin.

Winternitz and numerous other observers have shown that when water is taken in sufficient quantities, the temperature of the body may be lowered by the absorption of heat from the water. Suppose, for example, a patient having a temperature of 102° should swallow three pints of water at 60°. In acquiring the temperature of the body, the water swallowed will absorb 126 heat units. In the case of a patient weighing one hundred and twenty pounds this would induce a fall of temperature of more than 1°, provided, of course, that the heat production and heat elimination continued at a uniform rate.

A general fall in the temperature of the body of .4° C., sometimes more, was observed after drinking water at a temperature of 60° to 65°. Water taken at a lower temperature and in larger quantity has been shown by Winternitz to be capable of reducing the pulse twenty beats and the temperature .8° C. (1.4° F.). The temperature of the urine was found to be .7° C. (1.3° F.) below the normal.

Winternitz, by means of a thermometer introduced into the stomach itself, made interesting observations upon the effect of water drinking upon the local temperature. A half hour after drinking a pint of cold water the temperature of the stomach was found to be .6° C. (1.08° F.) below its normal temperature. The rectal temperature was found to be still lower, sinking gradually from the time the water was taken for nearly half an hour, when the maximum reduction of more than 1° C. (1.8° F.) was found. The axillary temperature at first rose slightly, then fell, the temperature remaining below normal for more than an hour. The pulse was decreased ten beats. This curious fact was noted,— that the temperature reduction was greater in the rectum than in the stomach. On reversing the experiment and introducing the water into the rectum, it was found that the temperature in the stomach was reduced more than that of the rectum, falling to .9° below the normal.

A decided fall of the surface temperature at the epigastrium may be observed

after cold water drinking, as well as general reduction of temperature, indicated by thermometers placed in the axilla and rectum. This fact was first observed by my assistants, Drs. Otis and Edwards, while conducting a series of observations (1898) to determine temperature.

In cases of chronic inactivity of the skin, cold water drinking is an exceedingly valuable measure, but it must be employed with discretion, as inactivity of the skin usually means an inactive mucous membrane, so that liquids are absorbed with difficulty. In cases of chronic dilatation of the stomach, water drinking, while indicated as a means of relieving the general condition, may be inadmissible on account of the state of the stomach. In these cases water may be introduced by enema.

Copious water drinking is one of the most effective means of relieving a common cold, by aiding in the elimination of tissue poisons, the accumulation of which gives rise to the difficulty known as "a cold."

One or two glasses of cold water taken half an hour or an hour before breakfast prove in many cases an almost perfect panacea for chronic inactivity of the bowels. Hundreds of patients have been cured by this simple remedy alone. At a meeting of the New York Academy of Medicine attended by the writer more than twenty years ago, a leading physician of New York City stated that he had successfully treated more than one hundred cases of constipation by this simple means.

Chronic biliousness, which is nothing more or less than chronic toxemia resulting from the putrefaction of animal food substances in the alimentary canal, requires the free use of water. Eight or ten glasses a day would be none too much in cases of this sort.

In cases of gall stones and infectious jaundice, water drinking is certainly indicated. The amount taken should be ten or twelve glasses a day, if possible, so that the liver will be thoroughly flushed and the bile so diluted that it will be able to dissolve and remove any concretions which may be present. In cirrhosis of the liver arising from either indigestion or alcohol, water drinking is essential as a means of aiding the liver and the kidneys to perform the work required of them in the removal of a large quantity of alimentary poisons in addition to the toxins naturally produced within the body by the physiological processes of tissue change.

In the treatment of the opium, alcohol, tobacco, and other drug habits, water drinking renders important service by hastening the elimination of the drug and in aiding liver work and general oxidation.

The temperature of the water drunk should ordinarily be about 70° F. In special cases water at 60° and even 50° may be employed. Very cold water is indicated only in fevers, in constipation, and in small quantities in hypopepsia.

The quantity of water taken must depend on the effect desired. In fevers, a good rule is to take a glass of water every hour. In hypopepsia, one third or one half a glassful of cold water may be taken half an hour before eating. For inactivity of the bowels, one or two glasses of cold water should be taken on retiring at night, and as much more on arising in the morning. A thirst for water is almost always an indication that it may be taken with advantage, no matter whether such use is in harmony with the established canons of hygiene or not. It is safer to trust to the natural instincts than to pin one's faith to a theory. Almost the only decided contraindication is in connection with meals, when free water drinking prevents proper insalivation of the food.

The Best Water.— The purest water is universally the best. Whatever beneficial effects are obtained from water drinking must be attributed to the water itself, and

not to any ingredients which it contains. Mineral waters are simply diluted drugs. The ingredients may be obtained at any drug store, and if diluted to the same extent as that in which they are found in the so-called natural waters, the effects obtained from their use would be the same. Medical experience has shown that the best of the so-called mineral waters are those which contain the least mineral ingredients. The very best water is distilled water which has been well aërated. Water obtained from natural sources is generally more or less contaminated, that from lakes, streams, and rivers being necessarily defiled by the fish and other creatures which live in natural bodies of water, and by surface drainage, which, after every rain, washes out quantities of filth.

Water obtained from public supplies should always be boiled; indeed, this precaution is a wise one under nearly all circumstances.

Hard water should always be boiled for a long time to eliminate, so far as possible, the lime which it contains; but even when boiled it is by no means free from this injurious ingredient. The larger the amount of saline ingredients, the more slowly the water is absorbed. The presence of acids encourages absorption. Carbonated distilled water and diluted fruit juices without sugar are the best drinks.

HOT WATER DRINKING.

Hot water drinking has of late years been enormously overdone. In the United States, and doubtless in other countries, many persons have been injured by deluging their stomachs with quantities of hot water several times daily. The writer has met a number of patients who were taking three or four glasses at once in this way at a temperature which would seem positively incredible. In one instance a gentleman was found sipping a glass of water at a temperature of 160°. The free use of hot water has been largely encouraged by physicians who recommend an exclusive meat dietary, experience having taught them that the free use of meat must be accompanied by copious water drinking as a means of ridding the system of the ptomains, toxins, and various other poisonous substances which are always to be found in the body of a dead animal. Water drinking in these cases is doubtless a means of saving the patient's life under conditions which would otherwise lead to speedy exhaustion of the defenses of the body, and thus precipitate some acute and perhaps fatal malady, as Bright's disease, organic changes in the liver, arteriosclerosis, etc.

The fact that hot water has proved serviceable in some cases has led to its excessive use by a large number of persons who have suffered serious consequences from the practice. The general effect of hot water drinking is to debilitate the digestive system, while cold water acts as a tonic. Heat and cold, when brought in contact with the mucous membranes, produce effects entirely analogous to those resulting from their application to the skin. When heat is applied, the result is first a stimulation, quickly followed by a tonic reaction lasting for a considerable length of time. In this condition the blood vessels of the stomach are contracted, the circulation is less active, and the activity of the peptic glands, if not entirely suspended, is greatly diminished, so that the quantity of hydrochloric acid produced is smaller than under ordinary conditions. When cold is applied, the opposite effect is produced. The blood vessels are first contracted, but later, tonic reaction occurs, the movement of blood in the vessels is accelerated, the glands become more active, and the functions of the stomach are quickened.

From these facts it is apparent that hot

water drinking is a measure likely to prove of great service in hyperpepsia, and likewise in gastrorrhea, as in these conditions there is an excessive production of hydrochloric acid. In order to be beneficial in cases of this sort, the water swallowed must be very hot, the temperature being 130° to 140°, and should be swallowed rapidly, so that it may be cooled as little as possible before coming in contact with the stomach.

Hot water drinking is very useful in gastralgia, especially when accompanied by vomiting. Slowly sipping hot water will sometimes relieve vomiting, not only in gastralgia, but in other conditions. Hot water drinking also affords relief in the colic pains frequently the result of the habitual use of milk from a neglected nursing bottle or some similar cause. It is an invaluable remedy in chronic gastritis, or gastric catarrh.

REVIEWS.

SEXUAL DEBILITY IN MAN.— By Frederic R. Sturgis, M. D., formerly Clinical Professor of Venereal Diseases, Medical Department, University of the City of New York; Ex-Visiting Surgeon to the City Hospital, Blackwell's Island; author of "A Manual of Venereal Diseases;" one of the authors of "A System of Legal Medicine," etc.

Dr. Sturgis has for many years devoted his attention exclusively to venereal and genito-urinary diseases. He has long been considered by the medical profession in this country as an authority in his specialty, and his distinguished ability has received ample recognition abroad. This work is a noteworthy one, embodying the results of his extensive experience covering the observations of many years.

The author's principal reason for writing this book is to introduce to the reading medical public sundry opinions he holds upon sexual weaknesses in men, which, although they may be at variance with ideas generally received in this country, he is convinced from experience are correct.

In the chapter on masturbation he has combated the old and time-honored belief that indulgence in this habit is the necessary prelude to both physical and mental degeneration, and while not glossing over the dangers which may, under certain conditions, result from the habit, he has attempted to point out the folly of the hysterical denunciations which have been heaped upon it by pseudo-philanthropists and ignorant medical men. The question of castration in the case of masturbating lunatics has been brought up afresh for discussion, and the author has frankly stated his reasons for believing that, under certain circumstances, such a procedure would not only be justifiable, but proper. He has also separated spermatorrhea from pollutions, aiming to show that the two are absolutely distinct and separate diseases; that spermatorrhea is not the finale of pollutions, but is a disease *sui generis*, the symptoms, course, and treatment of which are entirely different from the latter. He has also striven to correct the foolish and ridiculous idea that the man afflicted with spermatorrhea is foredoomed to impotence and sexual uselessness.

Complete in one octavo volume, about 450 pages, illustrated, neatly printed, and substantially bound in cloth. $3.00 net. E. B. Treat & Co., publishers, 241–243 West 23d Street, New York.

THE PHYSICIANS' VISITING LIST.— Lindsay and Blakiston's for 1901. Fiftieth year of its publication. P. Blakiston's Son & Co. (successors to Lindsay and Blakiston), 1012 Walnut St., Philadelphia. Sold by all booksellers and druggists.

The fact that the present issue of the "Physicians' Visiting List" is the fiftieth one, is ample evidence of its value, and this fact alone commends it to the physician. Besides containing blank leaves for visiting list, memoranda, addresses of patients and nurses, accounts asked for, memoranda of wants, obstetric engagements, vaccination engagements, record of births and deaths, cash account, etc., it contains calendar for 1901 – 1902, table of signs, the metric system of weights and measures, table for converting apothecaries' weights and measures into grams, dose table, asphyxia and apnea, comparison of thermometers, and a new and complete table for calculating the period of utero-gestation. Prices, $1.00 to $2.25, postage prepaid.

The Battle Creek Sanitarium

LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
NEWTON EVANS, M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR NOVEMBER.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
103 per cent.	10	3	13
100 " "	51	39	90
95 " "	11	18	29
93 " "	8	16	24
91 " "		1	1
88 " "	1	6	7
85 " "	2	6	8
83 " "			2
78 " "	2	2	2
71 " "		2	2
Below 71 per cent.	4	1	5
Total	89	94	183

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	40	12	52
Between 4,500,000 and 5,000,000	35	49	84
" 4,000,000 " 4,500,000	7	25	32
" 3,500,000 " 4,000,000	1	5	6
" 3,000,000 " 3,500,000	3	3	6
" 2,500,000 " 3,000,000			
Below 2,500,000	2		2
Total	88	94	182

Examination of Sputum.— There were 13 examinations made, 12 being new cases. Tubercle bacilli were found in 1 case.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	32	82	9	100	45	68	86	75
Less than 10,000 bac.	6	16			5	8	11	10
Between 10,000 and 100,000 bac.					6	9	6	5
More than 100,000 bac.	1	2			10	15	11	10
Total	39	100	9	100	66	100	114	100

The patients were received from the following States and countries: Michigan, 24; Ohio, 13; Indiana, 13; Illinois, 8; Iowa, 6; Wisconsin, 6; New Jersey, 4; New York, 4; South Dakota, 3; Tennessee, 3; Missouri, 3; Nebraska, 3; Kentucky, 3; Pennsylvania, 4; North Dakota, 2; California, 2; Montana, 1; Louisiana, 1; West Virginia, 1; Georgia, 1; Connecticut, 1; Minnesota, 1; Arkansas, 1; Texas, 1; Mississippi, 1; Colorado, 1; Canada, 1; Hawaiian Islands, 1; unclassified, 1. Total, 114.

Urinary Laboratory.—Total number of specimens examined, 651; number of new cases, 195; number of cases having albumin, 11; sugar, 6; casts, 2; blood, 1; pus, 1.

PUBLISHERS' DEPARTMENT.

THE ninety-fifth annual session of the Medical Society of the State of New York will be held in Albany, Jan. 29, 30, 31, 1901.

The meetings of the Society have always been replete in scientific work, as becomes the representative society of the medical profession of the Empire State, and it is confidently expected that this meeting will equal those which have preceded it.

Notice has been sent to every member of the Society with the request that those who desire to read papers will communicate at once with the Chairman of the Business Committee, Dr. Frank Van Fleet, 63 East 79th Street, New York City, or with the President, Dr. A. M. Phelps, 62 East 34th Street, giving the title of the paper and such other information as the writer desires.

As there will be a great many papers offered, and the time necessarily limited, it is suggested that papers be condensed as much as possible in reading, as they can be published more fully in the Transactions. Arrangements for reduced fares can be made when purchasing railroad tickets.

MODERN MEDICINE

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ORIGINAL ARTICLES.

THE HYDRIATIC TREATMENT OF TUBERCULOSIS.[1]

BY J. H. KELLOGG, M. D.,
Superintendent of the Battle Creek (Mich.) Sanitarium.

(Concluded.)

Symptomatic Measures.— While the various distressing and threatening symptoms present in tuberculosis are for the most part relieved by the general treatment before outlined, special applications of various sorts render great service. The general symptoms for which the foregoing treatment acts almost as a panacea are anemia, nervous and muscular weakness, and emaciation. The relaxation and unhealthy condition of the skin likewise disappear rapidly under the powerful vasomotor gymnastics of cold-water applications. Various localized and special measures are needed to meet particular conditions and symptoms. The following measures, recommended for special conditions, have all been tested and proved valuable in the hands of the writer and his colleagues in dealing with the conditions for which they are commended.

Cough.— The chest pack at night (Figs. 9–12); sipping hot water when the paroxysm is threatened, in cases in which the cough is due to irritation in the throat. If hard coughing is due to the viscidity of the secretion, copious drinking of warm or hot water will afford relief. When the cough is exceedingly troublesome, the chest pack should be worn during the day, as well as at night. The chest should be rubbed well, first with the hand dipped in water at 50° F., then with the dry hand, before the pack is applied. In cases in which emphysema exists, with cavities in which secretions accumulate to the detriment of the patient, the cough being too weak to expel the secretion, the expulsive efforts of the lungs may be reinforced by slapping the chest with the hand or a towel dipped in ice water just before applying the pack. These measures should not be applied if there is danger of hemoptysis.

Through the nervous and vascular relations of the skin with the internal viscera it is possible by means of thermic applications to the surface of the body to exercise almost complete control over the general movement of blood in the body, and local blood-supply as regards both volume and rate of movement of blood. Every internal viscus is represented from the surface of the body by an area with which it is in reflex relation through the vasomotor centers. The cutaneous areas related to the lungs comprise the skin covering the chest, especially the anterior portion of the chest, the shoulders, the anterior lower surface of the neck, the arms, especially the palms of the hands. Applications to this surface produce effects differing according to the temperature, duration, and mode of procedure. A short cold application produces contraction of the bronchial vessels, which is followed after the withdrawal of the application by dilatation with increased activity of the bronchial vessels and increased movement of the blood through the lungs. Prolonged cold applications produce prolonged contraction of the bronchial vessels, provided the sensibility of the cutaneous nerves is maintained by occasional short applications, by rubbing with warm, dry flannels, by removal at frequent intervals of the cold application long enough to allow reaction to occur, or by allowing the cold compress to become slightly warm before removal.

A heating compress, that is, a cold compress well covered and allowed to accumulate heat until it attains the ordinary temperature of the skin or a little more, causes first a brief contraction of the bronchial arteries, followed by a

[1] Reprinted from *Medical News*.

dilatation and increased activity of the nutritive vessels of the lungs with diversion of blood into the intercostal veins, thus facilitating the movement of the blood through the lungs, diminishing passive congestion and encouraging leu-

FIG. 9. — ROLLER CHEST PACK (FIRST STEP).

cocytosis. Short hot applications to the chest-wall divert blood from the bronchial vessels into the collateral vessels — the internal mammary and the intercostals.

By alternate hot and cold compresses a sort of pumping action may be operated upon the lungs. The cold application contracts the small vessels, thus emptying the tissue, while the succeeding cold application is forced onward into the venous circulation. The effect of a hot application can be renewed as often and as long as desired by brief cold applications at intervals of ten or fifteen minutes. The effect of cold applications may likewise be prolonged by brief applications of heat at short intervals.

The chest compress not only combats the irritation and passive congestion to which the cough and expectoration are due, but lowers temperature, and by increasing the movement of healthy blood through the parts improves the nutrition of local cells, removes and neutralizes the toxins by which their resistance is low ered or destroyed, and especially encourages leucocytosis, the most effective means by which the body can combat the bacillus.

The effect of the chest pack in relieving the cough is often magical. Patients who have been almost entirely deprived of rest by a troublesome night cough are often at once so relieved that abundance of refreshing sleep is obtained by the simple application of the chest pack at bedtime. In cases in which the circulation is feeble, the wet towel should be covered with oiled muslin, mackintosh, or gutta-percha tissue, in addition to the flannel wrappings. Either the roller or the square chest pack (Figs. 13–16) will be found convenient for use in cases of this sort.

Expectoration. — When expectoration is scanty, copious water drinking is advantageous by increasing the secretion of the pulmonary mucous membrane. The viscid secretion is so diluted that it may be easily expelled. The chest pack diminishes excessive secretion by relieving irritation and resulting cough when expectoration is not present.

Pain. — Short fomentations followed by the heating compress are the best means of relieving pain. Pleuritic pain sometimes requires the application of a tight bandage about the lower part of the chest. If necessary, hydriatic applications may be reapplied over the outside of the bandage. Fomentations applied to the chest should be short, not more than five or ten minutes, and as hot as can be borne. The heating compress should be prepared with very cold water, should be wrung very dry, and should be instantly applied when the hot compress is removed.

Hemorrhage. — This grave symptom is not, of course, always easily controlled. Even hydriatic applications sometimes fail because of the large size of the ruptured vessels giving rise to hemorrhage. The best measures are hot applications to the lower extremities, as the hot leg-pack, cold compresses applied to the chest, consisting of a folded towel or six or eight thicknesses of cheese cloth; very hot applications applied to the cervical spine, covering especially the *vertebræ prominens*. Solly has called attention to the fact that atropine, if used in sufficiently large doses (one fiftieth of a grain), sometimes renders service in checking hemoptysis by lowering blood pressure. Blood pressure may be lowered to almost

any degree desired by the hot blanket pack and by vigorous friction of the skin. By these means the blood vessels may be dilated to such a degree as to contain nearly two thirds of all the blood in the body. In the application of friction the rubbing should be outward from the heart, or following the distribution of the arteries, so as to lessen the movement of the blood toward the heart and the chest. Reflex contraction of the pulmonary vessels may be induced by ice to the hand and over the neck. Care must be taken to keep the arms warm, so as to favor hyperemia of these parts and collateral anemia of the lungs. No part of the surface, with the exception of the chest wall, should be allowed to become chilled. It is often better to apply a fomentation to the whole back to relieve the bronchial arteries by diverting the blood into the intercostals, while at the same time contracting the vessels of the lungs by cold applications to the front chest, preferably a cheese-cloth compress wrung out of ice water, and renewed every minute. If the application is long continued, the skin should be rubbed with dry, warm flannel at intervals of five minutes to maintain cutaneous sensibility, which is essential for the stimulation of the vasomotor centers.

Dyspnea.— Paroxysms of dyspnea are best relieved by short, hot applications to the spine, the hot foot or leg bath, and the hot leg pack. Hot sponging to the chest and spine is an excellent measure. When due to disordered digestion, fomentation over the stomach should be administered; when constipation exists, a warm enema. A fomentation to the spine, with a cold bag or compress over the stomach, is useful in dyspnea due to distention with gas.

Irritation of the Throat.— This condition, which appears in its most aggravated form in cases of laryngeal tuberculosis, requires the throat pack, which may be worn night and day. Hot-steam inhalations are sometimes of service, but generally fail in tuberculous laryngitis.

Chill.— This symptom requires rest in bed, wrapping in blankets, hot bottles to the sides and feet, hot-water drinking. The hour at which the chill arrives having been ascertained, the patient should be ordered to bed half an hour or an hour before the time at which the chill is expected to occur. Rubber bags filled with hot water or hot bottles should be placed at the feet and sides. He should be wrapped in warm blankets, and, if necessary, a dry pack should be administered in the ordinary way. The occurrence of slight perspiration will do no harm, provided it is not induced too rapidly. Great care should be taken to avoid subsequent chilling after perspiration has occurred. If the intensity of the chill is lessened, the reactionary fever will be less intense.

Fever.— When elevation of temperature is a marked symptom, the neutral bath may be employed with advantage and with perfect safety at a temperature of 92° to 95° F. for an hour. The best time for the bath is half an hour to an hour before the time at which the temperature usually reaches its greatest intensity. By this means the febrile process may be controlled, and as the application is renewed from day to day, the febrile movement may be found to yield more readily. The chest pack also assists greatly in reducing temperature. When the temperature of the patient rises at night to 101° F. or more, the compress should be lightly wrung in the application of the chest pack. Thus considerable antipyretic effect may be secured. Free water drinking aids temperature reduction by eliminating the bacterial toxins to which the temperature elevation is due.

Night Sweats.— Profuse perspiration is but the natural cooling off of the fever. Suppression of chills and fever is quickly followed by this appearance of the night sweats. Sponging the whole cutaneous surface with water as hot as can be borne just at bedtime is an excellent means of lessening the cutaneous activity and securing comfortable sleep.

FIG. 10.—ROLLER CHEST PACK (CHEESE CLOTH IN PLACE).

Cardiac Disorders.— More or less cardiac disturbance is likely to occur in tuberculosis as a result of the great diminution of the respiratory area. Hypertrophy or dilatation of the right heart is frequent from this cause. Excessive ac-

tion of the heart should be controlled by rest in bed, and the application of the ice bag over the heart, or the cold precordial compress. The application may be continuous in severe cases; in other cases the compress should be applied every other hour. Short applications of the precordial compress are equally valuable in cases of cardiac weakness shown by feeble, frequent pulse, cyanosis, and laborious respiration. The duration of the application should be from fifteen to twenty minutes twice a day. Later the time may be extended to forty minutes or even one hour, forenoon and afternoon. There is no agent which exercises more powerful control over the heart than the cold precordial compress. It acts with greater promptness and certainty than digitalis or any other so-called "heart tonic." Short applications slightly energize the heart; prolonged applications exercise an equally marked sedative influence.

FIG. 11.—ROLLER CHEST PACK COMPLETED (FRONT VIEW).

Digestive Disturbances.—These are generally of the atonic variety. The stomach is dilated in a large proportion of cases of pulmonary tuberculosis. In fact, there is no doubt that digestive disorders, with resulting failure of nutrition, lay the foundation for the disease in a great majority of cases. The futility of stomachics and so-called "digestive stimulants" of various sorts which are commonly used in tuberculosis, has been well shown by Skeritt. This observer found by post-mortem examination that the activity of the pancreatic extract in consumptives was diminished fifty per cent. The diastatic examination of the saliva in living consumptives showed depreciation of the salivary secretion to the same degree. These observations agree with those of the writer as to the condition of the saliva in tuberculosis. Its activity is almost invariably diminished. This fact accounts, without doubt, in large measure for the emaciation of consumptives and their inability to digest starch foods and fats. Digested foods are required and the application of such measures as will improve the metabolic activity of the secreting glands.

The most useful foods are such as have been subjected to preliminary digestion of the starch, either by means of heat or by vegetable diastase. Malt is useful as a food rather than as a digestive agent. It should be taken freely to the extent of several ounces daily. Maltose is easily converted into levulose, the form in which sugar enters the blood. Starch in the form of mushes and starchy vegetables is digested very slowly, while it ferments and sours easily. Starch converted into achroodextrin by exposure to temperature sufficiently high to brown it slightly, is, next to maltose, the most assimilable of foods. Toast and zwieback and roasted or browned rice are excellent examples of well-cooked farinaceous foods. Sweet fruits are still better, presenting sugar in the form of glucose ready for absorption and assimilation. Grapes and grape juice are especially rich in glucose, also sweet apples, figs, and most other sweet fruits. Malted milk and cream, malted nuts, and various malt and heat-digested cereals are useful in these cases as fat-producers.

Cold water is the most valuable of all remedies for this purpose. The general cold bath promotes glandular activity in all parts of the body, and it promotes the activity of the peptic glands, as has been clearly shown by examination of the gastric fluid, and by its general restorative effects promotes all the metabolic processes. The application of the ice bag over the stomach for half an hour before eating increases the digestive power of the stomach, as shown by the increase of appetite. The CO_2 compress is still more effective as a peptic promoter. The prolonged application of the hot compress after eating is as active in promoting digestion as the ice bag before the meal. A quarter of a glass of ice-cold carbonated water may be taken half an hour before the meal with advantage. These measures are infinitely superior to any medicinal remedies which can be administered in promoting the appetite and digestion. Predigested foods should be used in conjunction with the measures suggested.

Vomiting.—This symptom is generally the result of violent coughing. A dry

dietary, eaten slowly while lying down, is best. The patient should recline half an hour before eating, in order that the breathing may become tranquil, and the food should be eaten very slowly, to avoid hurried respiration. When cough is excited reflexly by irritation of the sympathetic, the hot and cold trunk pack or the hot chest and trunk pack, or both combined if necessary, should be applied half an hour before food is taken, and the duration of the compress should be two hours, or at least an hour, after the completion of the meal, the patient remaining in the meantime in a horizontal position. In mild cases a compress extending from the umbilicus to the clavicle, applied half an hour before eating, will be found sufficiently quieting to the sympathetic centers to prevent both cough and vomiting. A hot and cold trunk pack consists of a towel wet in cold water, wrung dry, and wrapped around the trunk, a hot bag over the stomach, and a warm, dry, folded blanket tightly enveloping the whole. The hot and cold chest pack is applied in the same way, only the hot application is made to the back instead of to the front of the chest.

Diarrhea.— When due to tuberculous lesions of the intestines or mesenteric glands, little more can be expected than moderate mitigation of the condition. If considerable pain is present, very hot fomentations should be applied for fifteen minutes once a day. This should be followed by the heating compress, to be worn night and day, changed once in four hours. The hot enema is sometimes useful.

In conjunction with hydriatic treatment, massage, carefully graduated and prescribed exercise, manual Swedish movements, Swedish gymnastics, out-of-door life, and climatic change may be expected to accomplish all that can be done in the curative treatment of pulmonary tuberculosis. If some assistance may be obtained from the local use of antiseptics and the administration of creosote and other measures, the chief reliance must be placed upon the powerful physiological measures which have been outlined, and which experience has proved to be capable of accomplishing results truly marvelous when compared with the results ordinarily obtained in the most unpromising class of cases.

Winternitz reports the cure of a large percentage of the cases which have come under his care at his institution at Kaltenleutgeben, the charming suburb of Vienna. Dr. Riley, superintendent of the Colorado Sanitarium, of Boulder, Colo., has reported a series of fifty-one cases of recovery, all of which were treated by hygienic care and the excellent climatic advantages of the Rocky Mountain region, at an altitude of about 5,000 feet. At the Guadalajara Sanitarium, Guadalajara, Mexico, most excellent results have been obtained by the same means. Scores of persons are to-day leading useful lives as the result of the employment of these rational measures at the institutions named, who would unquestionably have been buried long ago without the treatment administered.

Of the two hundred and forty cases treated within the last three years at the Boulder Sanitarium, one hundred and sixty have been cured or very greatly and more or less permanently improved. A large proportion of the remaining eighty have been temporarily helped to a marked degree, even though the disease was far advanced. It is very rare indeed that patients who are subjected to the treatment outlined in this paper do not very quickly show signs of improvement in increased appetite, lessened fever, lessened night sweats, and gain of flesh. Patients not infrequently gain at the rate of two to three pounds a week for several weeks in succession. The cough is lessened, strength as well as weight improves, and the patient not infrequently finds himself at the end of a few months looking as well and feeling as free from pain and discomfort as ever in his life.

FIG. 12.—ROLLER CHEST PACK COMPLETED (BACK VIEW).

Slight dyspnea is often the only symptom which remains, the permanence of this symptom being the natural result of the lessening of the respiratory area occasioned by the pathological processes characteristic of the disease.

It is my firm belief that the general adoption of hydriatic measures in the

treatment of pulmonary tuberculosis by the profession at large, and especially the application of these measures to the disease in its incipient stages, would result in saving at least nine tenths of the sufferers from the untimely death to which almost everyone is doomed under ordinary medical management.

Reports of a few cases are appended, which are presented to illustrate what may be expected of rational hydriatic treatment conducted under favorable conditions. An elevated region is unquestionably necessary to secure the best results from hydriatic treatment; nevertheless, the experience of Winternitz, Aberg, as well as my own, has clearly demonstrated that it is possible to effect a cure of tuberculous disease of the lungs by hydriatic treatment without this advantage.

FIG. 13.— SQUARE CHEST PACK (1).

CASE I.—Rev. G. T. came under my care in the autumn of 1896. I found a cavity as large as a hen's egg in the left apex. The patient was expectorating freely; portions of yellow elastic tissue and great quantities of pus were constantly present in the sputum. He had an even temperature of 103° F., pulse was 90 to 100, breath exceedingly short. The patient was greatly emaciated and scarcely able to walk. I pronounced the case hopeless, and advised the patient to return home, but he refused to do so, and insisted upon receiving treatment. He showed so much pluck and determination that I thought I ought to give him a chance. The result was that in four months the patient returned home with a normal temperature, only a slight cough, very little expectoration, and pulse 60. He was able to walk several miles and to resume his profession as clergyman. After a few months more spent under my care, by my advice he went to Colorado to reside. For many years I heard from him frequently, and he always represented himself as enjoying good health.

After seeing so many cases of recovery from this dread malady by the employment at the Battle Creek Sanitarium of the measures named, I determined several years ago to secure, if possible, the same advantages for patients in a dry and elevated region. Within the last five years the establishment of a well-equipped sanitarium under the same auspices at Boulder, Colo., has afforded opportunity for observing the progress of patients under rational treatment at an elevation of between five and six thousand feet. The large number of recoveries which have occurred and the astonishing rapidity with which they have taken place in many cases have convinced me that by a combination of thoroughly rational and physiological treatment with climatic advantages, a cure may be secured in seventy-five or eighty per cent of all cases of consumption when treatment can be begun in the early stages of the disease, and in perhaps forty or fifty per cent recovery may be expected in cases in which the disease has attained to the second stage before treatment is begun. Recovery may be expected in a small proportion of cases even when the disease has made still greater advances.

The following report of cases of pulmonary tuberculosis successfully treated by hydriatic measures at the Boulder Sanitarium, Boulder, Colo., has been kindly furnished by Dr. W. H. Riley, superintendent of that Sanitarium:—

"CASE II.—Mr. B., from Ohio, aged twenty-eight years, gave a history of tuberculous trouble in his family. The patient had enjoyed fairly good health up to about three years previously to placing himself under my care, when he had bronchial trouble, from which he partially recovered. Later his cough increased and he began to expectorate, and had a temperature of 101.5° to 102° F. at night. When he came to the Colorado Sanitarium he had a bad cough, expectorated, and had a temperature of 101° F. at night; was very weak, thin, and anemic, and could walk only a few rods at a time. Physical examination of the chest revealed a partial consolidation in the upper and middle lobe of the right lung, and the bacilli of tuberculosis were found in the sputum. He was placed under treatment and soon began to improve. His cough and expectoration disappeared and his temperature receded to normal. The improvement continued, and at the end of six months he had gained twenty-two pounds, weighing more than he had before in his life. The cough and expectoration had entirely disappeared. He had no rise of temperature and no signs of lung trouble. I examined this patient about a year after he was dismissed from treatment, and at this time there were no physical signs of any disease in his lungs. I have had opportunity to see this patient at frequent intervals for nearly four years. He has had no rise of temperature, no cough or expectoration, and no physical signs of the disease up to the present writing. He is now a prominent lawyer in the city of Denver, and enjoying a successful professional career.

"CASE III.—Mrs. B. F. J., from Alabama, gave the following history: Grandfather, grandmother, brother, and husband died of tuberculosis of the lungs the last six months before she came to Colorado, Aug. 2, 1899. The patient had never been strong, but felt well until twelve years ago, when she had an attack of typhoid fever, and was never as well since. For three years before coming to Boulder she was more or less troubled with indigestion, etc. In the fall of 1898 her physician discovered that she had tuberculosis of the lungs. She had had some cough, some expectoration, and slight rise of temperature in the afternoon for some months previously to coming to the Colorado Sanitarium. On her arrival the patient was very thin, pale, anemic, and had distressing symptoms of indigestion in the stomach and bowels; had great difficulty in finding anything she could eat, and food always gave her more or less distress; poor circulation, cold extremities, some cough, some expectoration, temperature 99° to 99.8° F. in the afternoon. Physical examination of the chest showed partial consolidation of the apex of the right lung. The bacillus of tuberculosis was found in the sputum.

FIG. 14.— SQUARE CHEST PACK (2).

During the first few weeks of treatment, the patient did not seem to make very much improvement. Stomach and bowels continued to give her very great trouble. By careful regulation of the diet and other treatment, this difficulty was overcome. She remained under treatment at the Sanitarium for about four months. After the first few weeks of her sojourn she began to improve, and from this time on until she left the Sanitarium her improvement was gradual and quite rapid. When she stopped treatment, November

28, she had no cough, no expectoration, no rise of temperature. Physical examination of the chest showed that the lung was almost entirely clear. She had gained twenty-eight pounds in flesh. She remained in the city after leaving the Sanitarium and was under my professional care. At the end of another two months she had gained forty-four pounds in flesh, had rosy cheeks, hard, strong muscles, and no signs whatever of any disease of the lungs, stomach, or bowels.

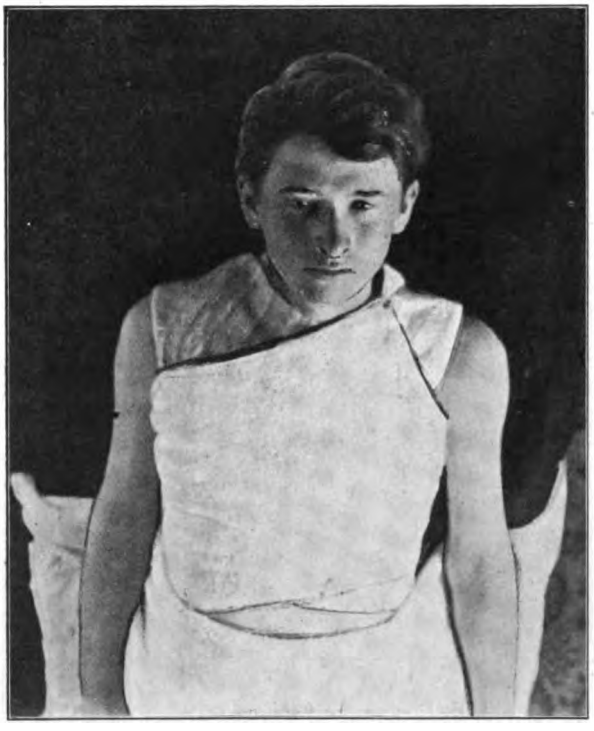

FIG. 15.—SQUARE CHEST PACK COMPLETED (FRONT VIEW).

At the time of present writing she is still enjoying good health and still holding to the flesh she gained. She weighs more than ever before in her life, and is strong and healthy in every respect.

"CASE IV.—Mr. H., from Pennsylvania, aged twenty-four years, came to the Sanitarium Oct. 18, 1899. He gave no history of any hereditary trouble in the family. One brother died of diabetes. Two years previously to his coming to the Sanitarium he spit blood, a mouthful at a time, and at different times had slight hemorrhage. Some four or five weeks before coming to the Sanitarium his physician made an examination of the sputum and found the bacillus of tuberculosis present. When the patient entered the Sanitarium, he had a cough, expectorated considerably, had pain in his chest, evening rise of temperature, night sweats, loss of flesh, trouble with shortness of breath, cold extremities, and weak action of the heart. He was thin, and unable to walk more than a short distance without fatigue. On physical examination of the chest there was found dullness of percussion and diminished respiratory murmur in the upper part of the right lung, and the same signs but to less degree in the upper part of the left lung. The patient had also more or less trouble with stomach and bowels with symptoms of indigestion. He remained from October 18 to February 21. When he left the institution, he had gained eighteen pounds in flesh, had no expectoration, the cough was practically all gone, and the temperature was normal. Physical examination of the chest showed some slight signs of thickening of lung tissue in the upper part of the right lung.

"CASE V.— Miss E., aged twenty-two years, came to the Sanitarium in October, 1898. Her family history was negative. Four years before entering the Colorado Sanitarium, the patient had slight hemorrhages at different times for about a week, blood coming up while coughing. She thought she completely recovered from this, and enjoyed very good health for a time. About one year before coming to the Sanitarium she coughed up a little blood again. In July, 1898, she had quite severe hemorrhage from the lungs, and had not been well since. When the patient arrived here, she had cough, expectoration, flushed face, and was pale about the nose and eyes; pulse, sitting, was 92; temperature at noon and in the afternoon 99.4° to 99.8° F. She was weak, not being able to walk far without becoming tired. She had lost considerable flesh, was more or less troubled with stomach and bowels, and with poor circulation. Physical examination of the chest showed dullness on percussion in

apex of right lung, diminished vesicular murmur, and subcrepitant râles over the same area. There was also some trouble with her throat, which was tuberculous in character. She remained under treatment until March 11, 1899. When she stopped treatment, she had gained very much in flesh and strength, had scarcely any cough, no expectoration, no rise in temperature, and was feeling well and strong.

"CASE VI.—Mr. F. R. P., from Georgia, aged twenty-three years, came to the Sanitarium, Dec. 17, 1897. Family history negative. Patient's health began to fail years before, during which time he suffered from indigestion while at school. He had a severe cough which lasted four or five months. When he came to the Sanitarium, he had cough, expectoration, temperature of 99° to 99.5° F. in the afternoon; symptoms of indigestion with poor circulation; he was very thin, anemic, and weak. Physical examination of the chest showed marked dullness on percussion, and bronchial breathing over apex of right lung. Under treatment he soon began to improve. Treatment was continued until May 10, at which time he had gained fourteen pounds in weight, and had no cough, no expectoration, and physical examination of the chest showed that the partial consolidation of the right lung which was present at the beginning of the treatment had almost entirely disappeared. I have watched this case now for nearly three years. The patient is an active business man in Colorado, and is enjoying the best of health at the present time.

"CASE VII.—Mr. M., aged twenty, from Wisconsin, came to the Colorado Sanitarium in July, 1896. His mother had some lung trouble the nature of which is not known. The young man had usually enjoyed good health prior to the beginning of his lung trouble, which was in the spring of 1896. His trouble began with night sweats, cough, expectoration, and considerable loss of flesh. A few months after the appearance of these symptoms, he came to the Colorado Sanitarium and placed himself under treatment. When he came, he was pale, anemic, and weak, with an evening rise of temperature. Physical examination of chest showed considerable thickening and consolidation of tissue in the upper part of left lung. Examination of sputum showed the presence of bacillus tuberculosis. As soon as placed under treatment he began to recover and made rapid improvement; temperature was soon reduced to normal; cough, expectoration, and night sweats disappeared. In a few weeks he had gained forty-five pounds in weight and proportionately in strength. During part of the time he gained one pound a day. He was a man of large physique, was well filled out, and gave every indication of robust health. Something like a year after his dismissal from the Sanitarium, I had an opportunity to examine his chest again. There were no signs whatever of the disease. For nearly four years now, the young man has been engaged in heavy manual work the greater part of the time, and he is enjoying the best of health.

"CASE VIII.—Mrs. B., from Kansas, came to the Colorado Sanitarium Oct. 10, 1899. She gave a history of consumption on her father's side of the family, and one sister died of pulmonary tuberculosis. The patient had the grippe in 1898, which left her with a cough. She had coughed and expectorated since, and her general symptoms grew worse. When she came to the Sanitarium, her symptoms were as follows: Appearance very poor, tongue heavily coated, white, and dry; digestion very much impaired, much constipation; high raging fever in the afternoon, and temperature of 103° F. or above; pulse 120 or more, sitting; patient very thin and very weak; respiration very rapid, dyspnea, and at times her general condition indicated approaching collapse; she could walk but a few steps at a time. Physical examination of the chest gave evidence of a large cavity in the lower part of the left lung, and physical signs of consolidation throughout the remaining part of the left lung; also crepitant and subcrepitant râles over the greater part of left lung; also some physical signs of consolidation in the upper part of the right lung. The patient was placed on rest-cure, and given such food as could be easily digested. She was given cool wet hand rubs, cool mitten friction in the evening with cool compress on chest, changed every fifteen minutes, and kept up from one hour to one hour and a half, and followed by a cold moist pack on chest which was worn through the night. This treatment was given every afternoon and evening, while the temperature was highest. In the morning, while the temperature was lower,

the patient was given heat and cold to the spine, with dry friction and an oil rub. The patient also used a nebulizer containing creosote and other antiseptics. The bowels were kept open, and the patient was requested to drink freely of water. The results of this treatment were most gratifying in this case of advanced pulmonary tuberculosis. It should be observed that the temperature of this case was 103° F. or more in the afternoon, and had been so for some time before the patient came to the institution. After one day's treatment the temperature dropped from 103° to 101.3° F. The next day or two there was a rise of a fraction of a degree, but this again receded and gradually declined. After one week's treatment the highest temperature was 100° F. in the afternoon. The patient remained under treatment only about two weeks, but the improvement was very marked in every way when she left the Sanitarium, her temperature being about 100° F. in the afternoon. The appetite was much improved, the breathing very much slower and deeper. Her general condition was greatly improved and with some friends she took an overland trip in an open wagon to Kansas. This patient might have been improved more had she remained under treatment longer. She discontinued treatment contrary to advice. This last case represents a class of cases that come to the institution in the advanced stage of the disease. These cases as a rule are not cured, but many are benefited, and the results of treatment, as illustrated in this last case, show clearly the beneficial effect of hydriatic treatment when properly selected and rightly applied, even in the advanced stages of pulmonary tuberculosis."

FIG. 16.—SQUARE CHEST PACK COMPLETED (BACK VIEW).

Summary.—The essential features of rational hydrotherapy as applied to pulmonary tuberculosis may be summarized as follows:—

1. Both general and local cold applications to the skin.

2. Careful graduation of the application as regards its intensity, duration, and frequency, by modifying the temperature and mode of procedure, keeping always within the limits of the patient's ability to react. The best methods for accomplishing this are dry friction, wet hand rubbing, wet mitten friction, cold towel rubbing, wet sheet rubbing, half baths, the general douche.

3. The application of compresses, hot and cold, as a means of relieving pain and controlling the local blood supply, especially the use of the chest pack to relieve cough and to aid the tissues in combating the disease, and the employment of the hot sponge bath and various other hydriatic means for relieving special symptoms.

I regard a dry, elevated region a condition essential for the best results in the majority of cases. In observations upon some hundreds of cases during the last twenty-five years, I have seen excellent results at altitudes ranging from 1,500 to 5,500 feet. The constant application of stimuli of various sorts upon the skin, such as sunlight, variations of temperature, etc., is an important means of maintaining vascular tone in the internal parts of the body, and in stimulating metabolism and general functional activity. By hy-

drotherapy we are able to exaggerate or diminish the impressions sent inward from the skin, and thus to control nearly all the bodily functions to a marvelous degree.

In fairness I must say that I have seen good results in cases in which hydriatic treatment has not been systematically carried out. I must also record the fact that results have unmistakably been far more uniform, more permanent, when hydriatic treatment has been employed in connection with climatic change. For a number of years back I have been in the habit of sending cases of this class to the Colorado Sanitarium, at Boulder, Colo., or the Guadalajara Sanitarium, at Guadalajara, Mexico, where patients have the advantage of thorough hydriatic treatment, and the results have certainly been excellent. Not all patients have recovered, by any means, and it is very difficult to say in any case that an absolute cure has been effected.

In advanced cases in which the breaking down of lung tissue has advanced to the formation of large cavities, and when large areas are involved, the prospects for a radical cure by hydriatic methods is of course small; nevertheless, in even these unpromising cases, a marvelous degree of improvement is often secured, and the patient's life prolonged for many months, and even years.

Improved Differentiating Process for Typhoid Bacillus.—L. Remy (*Journal of Laryngology, Rhinology, and Otology*, October) urgently recommends this formula of the differentiating culture-medium: Distilled water, 1,000 gm.; asparagin, .6 gm.; oxalic acid, .5 gm.; lactic acid, .15 gm.; citric acid, .15 gm.; bisodium phosphate, 5 gm.; magnesium sulphate, 2.5 gm.; potassium phosphate, 1.25 gm.; sodium chloride, 2 gm. The different salts, with the exception of the magnesium sulphate, are pulverized, mixed with a liter of distilled water and 30 gm. of peptone, heated in the autoclave for fifteen minutes, and poured, while boiling, into another vessel containing 120 to 150 gm. of gelatin. When dissolved, soda is added until the mixture is slightly alkaline. It is then cooked in the autoclave under pressure for fifteen minutes, and rendered acid with a demi-normal solution of sulphuric acid in the proportion of .5 gm. of sulphuric acid to the liter. After stirring, it is returned again to the autoclave for eight to ten minutes, then filtered, and the acidity tested by adding 10 c.c. of the gelatin to 100 c.c. of distilled water and 4 to 5 drops of phenolphthealein. The demi-normal solution of soda is then dropped from a pipette until the red tint appears, which should be when 2 c.c. of the soda solution have been added to 10 c.c. of the gelatin. The magnesium sulphate is then added — 2.5 to the liter of gelatin — which is distributed in the tubes and sterilized three times. To each tube is added 1 c.c. of a 35 per cent solution of lactose and 1 c.c. of a 2.5 per cent solution of phenic acid. Colonies both of the bacillus coli and Eberth's bacillus appeared in two days, and differentiation was possible by the third, fourth, and fifth day in six out of the twenty-three cases described. The colonies of Eberth's bacillus are a bluish white, with no gas formation nor fermentation of lactose, and do not give the indol reaction. The bacilli are motile, and agglutinate at 1 to 80,000. The colonies of the bacillus coli are yellowish brown.—*Journal of the American Medical Association, Nov. 3, 1900.*

Diphtheria Bacilli in Healthy Throats and Noses.— Dr. Francis P. Denny says that diphtheria bacilli are seldom found in the throats of those who have not been exposed to diphtheria. They are more frequently found in those who have been exposed, especially in persons living under poor hygienic conditions or in institutions. In institutions the crowding together of a large number of persons in a limited air space favors the growth of the bacilli in healthy throats. Healthy individuals with virulent bacilli in their throats can spread the disease, and ought, therefore, to be detected and isolated. Cultures ought to be made among those who have been exposed to diphtheria: (*a*) by physicians among the members of families that have been exposed; (*b*) by inspectors in the schools; (*c*) by health officers whenever they think the disease is being or may be spread by such individuals.—*Boston Medical and Surgical Journal, Nov. 22, 1900.*

TRANSLATIONS AND ABSTRACTS.

[THE articles in this department are prepared expressly for this journal.]

Early Diagnosis of Cancer of the Stomach.— Wagner (*Wien. Med. Blätter*, May 10, 1900) says that in the great majority of cases, responsibility for the early diagnosis of cancer of the stomach rests upon the shoulders of the general practitioner. There is little doubt that cancer, including cancer of the stomach, is on the increase, and that we should be on the lookout in order not to miss an offered chance for early diagnosis. Besides, many surgeons regard cancer in this locality as more amenable to radical cure than in some other common sites, as the breast, tongue, etc.

Wagner divides the evidences available for early diagnosis of gastric cancer into three heads; *viz.*, etiological, symptomatic, and those brought out by physical diagnosis.

1. *Etiological.*— These include age, sex, previous disease of the stomach, occupation, and the like. Men are more commonly affected than women, and the period between the fourth and the sixth decennium is the favorite age. A minority of patients give a history of gastric troubles of some sort, and the occupations which exhibit the greatest percentage of gastric cancer are those which are associated with excessive eating or drinking, such as butcher, hotelkeeper, brewer, etc.

2. *Symptomatic.*— As a rule, the earliest complaint of the patient refers to distress after eating, with sour eructations, and later, vomiting, which is characterized by affording no relief. At a later period the discomfort felt after meals becomes distinctly painful. Vomiting persists, and presently we find in the expelled matters the peculiar brownish masses which denote that hematemesis has begun. Loss of blood is usually slight. Anorexia and loss of strength soon set in, and the absence of the desire for food, together with the vomiting, causes a striking loss of weight. A sacrifice of flesh to the amount of twenty-five pounds in three months is not uncommon in these patients

3. *Physical Examination.*— The pallor and dirty yellowish color which are seen early in the history of gastric cancer are not to be confounded with the cancerous cachexia, but in this particular affection rather signify a condition akin to pernicious anemia. The blood count falls to 3,000,000 per cubic millimeter, and the percentage of hemoglobin is also a fourth or third less than normal.

With regard to physical examination of the tumor itself, palpation, when it can overcome the natural muscular defense, is of much value in confirming a diagnosis, as a hard mass may often be felt. A special train of symptoms is in evidence when a pyloric cancer is present with resulting dilatation of the stomach.

In all doubtful cases, the stomach contents should be siphoned out about an hour after a trial breakfast. There is almost universal agreement that in gastric cancer free hydrochloric acid can not be found in the stomach during several hours after the trial meal. In many cases it appears to be replaced by lactic acid.— *Medical Review of Reviews, Aug. 25, 1900.*

Alcoholism and the Nervous System of Children.— Dr. M. Kende (*W. Med. Woch.*, I, No. 52; *Cas. Lek. Ceskysh*, XII, No. 11) has made experiments to determine the effect of alcohol on the intellect of children from six to fifteen years of age. Twenty-five children were divided into four groups: Ages from 6–7, 8–9, 10–12, and 13–15. Small drafts of wine were given the children in the forenoon from 0.05 of a liter to 0.21, and after a time he examined them in their usual school subjects. Two of these children were kept as a control series or group. The changes observed as differing from his control group were as follows:—

Reading: Faster, better accentuation, livelier, and exhibition of pathos. When asked to repeat a portion just read, only part or at most half could be repeated.

Arithmetic: Easy examples given were satisfactory for the most part, but occasionally grossly faulty. Passages previously memorized could be repeated in part only about half.

Composition: By the older groups was well done as to form and expressions used, but the conceptions were superficial, and showed no deductive thought.

During the examination the children laughed, joked, or scolded and fought among themselves. The writer accounts for these changes by the sudden stimula-

tion of sensitive nerve centers in a delicate nervous organism. He warns against the daily use of alcoholic beverages for children. They will thus be spared from acute indigestion, dulled intellects, convulsions, neuroses, and, lastly, acquired psychoses. He is inclined to believe that children inherit the tendency and inclination to intoxication. He proves the degenerative influences of alcohol by the following statistics: —

In 46 observed families, father and mother alcoholic, 13 were childless, the rest having 72 abortions in 172 pregnancies. Of their 69 children, 20 died in infancy, the majority in convulsions; 32 had developmental defects, and had convulsions and anemia. Only 17 were considered healthy (17 : 141).—*The Post-Graduate.*

Weigert's New Stain for Elastic Fibers.— Dr. Maximilian Herzog (*Jour. App. Mic.*, III, No. 8, p. 958) reports that Weigert says the stain may be employed after fixing and hardening in alcohol, formalin, Mueller's and Flemming's fluid, and corrosive sublimate. The writer finds that when the latter has been employed as a fixative, it is necessary to remove carefully, by Gram's iodin solution, all traces of the bichloride of mercury; otherwise the elective stain is less satisfactory.

The formula for Weigert's new stain is as follows: —

1. Take 2 gms. of fuchsin (the ordinary basic fuchsin used for bacterial stains, *not* Weigert's acid fuchsin) and 4 gms. of resorcin, boil in 200 c.c. of water in an evaporating dish.

2. When boiling, add 25 c.c. of liquor ferri sesquichlorat, stir and keep boiling for two to five minutes.

3. Cool and filter. There remains on the filter a dark precipitate.

4. When all fluid has drained off, dissolve the precipitate on the filter in 200 c.c. of 94 per cent alcohol, which is boiled in the evaporating dish first used.

5. When the alcohol has boiled and everything has been dissolved, cool, bring up to 200 c.c. again, by adding 94 per cent alcohol, and finally add 4 c.c. of HCl. The stain is at once ready for use.

6. Stain for twenty to sixty minutes.

7. Wash in absolute alcohol (about one minute).

8. Clear in xylol (carbol-xylol or anilin oil must not be used).

Preliminary staining of the sections may be done with one of the carmin stains (alum, borax, or lithium carmin).—*The Post-Graduate.*

Gastroptosis.— Lockwood, in an article on this subject (*Medical Record*, Dec. 1, 1900), concludes as follows: (1) In the great majority of cases an adequate cause for the gastroptosis is not discoverable; (2) gastroptosis does not of itself, in an uncomplicated form, produce symptoms; (3) the displacement of the stomach, however, is a predisposing cause of a variety of gastric neuroses, of sensation, motion, and secretion; (4) these neuroses are usually induced by definite mental or physical strain; (5) the displacement of the stomach is a strong exciting cause for muscular atony, which atony is the most common cause for the symptoms presented; (6) a complicating atony is associated with a more or less profound neurasthenia, and a direct relation exists between these two conditions; (7) gastric acidity is increased in direct proportion to the atony, unless counteracted by gastritis; (8) mild degrees of gastritis are apt to occur in stomachs that are displaced, but the symptoms are neither severe nor persistent; (9) gastritis occurring in atonic and displaced stomachs reduces the excessive acidity of these, and seems to modify the severity of symptoms; (10) atonic dilation without mechanical hindrance is exceedingly rare; (11) dilatation, or better, muscular insufficiency, may occur in gastroptosis from duodenal kinking, from arterio-mesenteric constriction, or pyloric spasm; (12) pyloric spasm is common in displaced atonic stomachs with hyperacidity, and may lead to a temporary dilatation; (13) in a large number of cases, inattention to the conditions of atony, of neuroses, and of gastric secretions has led to an unsuitable, insufficient diet, which reacts both on general nutrition and on local conditions within the stomach; and (14) surgical intervention is applicable only to the cases in which dilatation exists.

Gastrointestinal Disinfection. — Nicati and others have shown that to produce general infection by injection of cholera cultures into the duodenum, some injury to the intestine is necessary, and that otherwise the bacteria die in the intestine. Schutz (*Berl. klin. Woch.*, June 18, 1900) has investigated this intestinal disinfectant action on the cholera vibrio. In the stools of dogs fed with cultures of the bacillus, none of the organisms were to be found. The gastric juice was then excluded by a cannula placed in the duodenum, and the culture was introduced directly into the latter. In this case, also, the stools were free, the rectal contents also free, the colon gave only one colony, and in the small intestine, cultures were obtained only with difficulty. Exactly similar results were obtained by investigating the intestinal contents of animals to whose food the cultures were added, showing that the hydrochloric acid of the gastric juice does not take the active part in disinfection that has been assigned to it. An interesting discovery was that after castor oil and calomel (especially the latter) the bacilli are found even in the stools, and the ordinary bacteria are also more numerous. It is to be deduced from the experiments that, apart from disinfection by gastric juice, which is very transient in its action, there is some natural antiseptic excreted by or in some other way connected with the small intestine, which is active in the absence of both hydrochloric acid and bile, and probably of the nature of a ferment, as suggested by Buchner. Calomel interferes with this antiseptic action, and though Schutz does not argue that artificial disinfection should be abandoned, yet he maintains that it rests on a very uncertain basis.— *British Medical Journal, Nov. 17, 1900.*

The Value of the Hot-Water Immersion Bath in the Treatment of Threatening Puerperal Eclampsia.— Charles M. Green believes that the hot-air bath is most appropriately used in the treatment of actual eclampsia. The hot wet pack is often successful in its results, but when circumstances permit its use, the hot-water immersion bath more satisfactorily meets the indications. Not only does it produce profuse diaphoresis and reduce blood tension, but it acts as a marked sedative to the nervous system. The bath is easily administered to a conscious patient, the aid of a single assistant being sufficient. The water should be as hot as can be borne, and the patient should remain therein until profuse perspiration of the face shows that the sweat glands are in full activity. When free perspiration has been induced, the patient should be rolled in a blanket, placed in a warm bed, and covered with several blankets and perhaps a rubber sheet. The writer gives a number of cases illustrating the good effects of these baths. — *Boston Medical and Surgical Journal.*

Cardiac Stimulants.— Hare (*Therapeutic Gazette*, Oct. 15, 1900) calls attention to the disregard to essential details as to the action of this important class of drugs. In many cases he finds that symptoms supposed to be serious heart trouble are entirely due to the excessive use of digitalis. Not infrequently is the cardiac distress augmented by the use, also, of strong coffee. He therefore thinks it well to call attention to the fact that the best medicine for a tired heart is rest, not stimulants, unless they be conjoined with rest. Another misuse of cardiac stimulants is their employment in states of undue excitement of the heart, when cardiac sedatives are really needed. They are also often given without regard to the state they are expected to meet. The degenerated heart muscles can gain no advantage from the drug, and it actually increases the labor of the heart by contracting the blood vessels. If any drug is used in such conditions, it should be one like strophanthus or cactus, in its action only slightly, if at all, vascular. It is not rare to find digitalis given in full doses in cases of failing heart where the chief trouble is not in the heart itself, but in the condition of high arterial spasm or atheroma. If it is given in such cases, its vascular effect must be relieved by vascular relaxants such as the nitrites. In all heart disorders it is well to make an effort to discover if any cause exists which may be removed before using powerful heart tonics. Not rarely the stopping of tobacco, alcoholic drinks, overeating, sexual excitement, etc., will relieve the condition without the use of drugs.— *Journal of the American Medical Association, Nov. 3, 1900.*

Influence of Food on the Excretion of Urea.— E. Maurel (*Archives de Med. Exp.*, Paris, II, Nos. 1 to 4) bases this monograph on years of study of guinea pigs as herbivorous animals, hedgehogs as carnivorous, and of man on a mixed diet. The chief practical conclusions are that urea in health is derived from disassimilated albuminoid substances, from combustion of the excess of the nitrogenized elements of the food in the blood, and from the excess of albuminoid substances in the blood found in certain pathological conditions. The quantity of urea excreted has no diagnostic value unless the character of the food is known, as it varies with the latter more than is generally recognized. The minimum of urea from disassimilation is about .15 to .2 gm. per kilogram in a healthy, active man. This includes .07 to .09 gm. of nitrogen. The excretion of urea can be increased at will by increasing the amount of nitrogenous food. The normal average is .25 to .35 gm. This leaves a balance of .10 to .15 gm. for the urea derived from the food above the disassimilation urea. To maintain this normal average and supply the calories required, the food should contain one part of nitrogenous ingredients to four of the carbohydrates. This proportion of nitrogen is ample in health, and in case of defective elimination should be diminished rather than increased.—*Jour. Am. Med. Asso.*

Tuberculous Glands in Relation to Tuberculous Infection.— Von Noorden (*Münch. med. Woch.*, 1900, No. 4) states that now that so much attention is being paid to the subject of tuberculosis, the rôle of tuberculous glands as foci where the bacilli may long remain latent, should be insisted upon. According to different statisticians, between seventy and ninety per cent of all children suffer at one time or another from "enlarged glands." Whether this occurs in connection with some infectious disease or with a general scrofulous habit of body, the glands usually become infected with the tubercle bacillus; they may, of course, be definitely tuberculous to begin with. They remain in a state of chronic inflammation, and tuberculosis of the lungs is often to be traced to the multiplication and transference of the organisms from them. Von Noorden urges the value of the tuberculin test in cases where the tuberculous nature of the swelling is not certain, and incidentally suggests its value in distinguishing such a condition from sarcoma, Hodgkin's disease, etc. He has discarded all treatment except removal by operation as early as possible, even in the first year.— *British Medical Journal, Nov. 10, 1900.*

Toxic Nephritis and Uremia. — Lindemann (*Centralbl. f. allgem. Path.*, No. 9, 1900) has conducted an interesting series of experiments on this subject. A serum is prepared by injecting into an animal of one species (*a*) the finely pounded kidney substance of another series (*b*). The serum taken from *b* is found to act directly as a renal poison when injected into animals of species *a*. This "nepholytic" action is, however, much more powerful when the kidney substance injected into *b* is diseased, as, for instance, by acute nephritis. Lindemann produced acute nephritis in dogs by administering potassium chromate, and in experiments in part complementary to the above, he found that the serum of these dogs acted as a strong kidney toxin; in others, producing albuminuria, suppression of urine and uremia, in lethal doses. He proposes further investigation to discover what element of the serum is the active agent in producing these symptoms. No potassium chromate is present, and normal blood serum has no such effect.— *British Medical Journal, Nov. 10, 1900.*

Diphtheria Contracted from Rabbits.— Grafton, Ill., has had a serious epidemic of diphtheria, and the cause is attributed to the increased consumption of rabbit meat. The surrounding country about Grafton has been overrun with rabbits, and the market has been overstocked with their dead bodies, making rabbit meat very cheap. The result has been that large quantities of this meat have been used as food. Within a short time hundreds of dead rabbits have been found near the town. This raised the suspicion of the physicians, who made a microscopic examination of the rabbits, and found that they had succumbed to diphtheria.

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

The Dissemination of Tubercle Bacilli by Cows in Coughing as a Possible Source of Contagion.— Dr. Ravenel (*University Medical Magazine*, November; N. Y. *Med. Jour.*, Dec. 8, 1900) has made careful investigations with reference to this matter. His experiments consisted in the use of an ordinary nose-bag, near the bottom of which was placed a shelf of soft pine wood, which was sterilized by steam heat each time before using. Such a nose-bag might be left on the animal for several hours at a time, the amount of material collected varying greatly in different animals, and in the same animal from day to day. The smallest particle ejected by the cow during the act of coughing adhered to this piece of soft pine wood, which absorbed most of the fluid portion, leaving the more solid particles standing in relief, so that they could easily be detected by the naked eye or by a low magnifying glass. From this they were removed with a platinum needle to a coverslip, and examined under the microscope. By this means he had been able to detect tubercle bacilli in the bronchial secretions of every tuberculous cow in which it had been tried. In one animal the amount of secretion was exceedingly minute, and even after the nose-bag had been kept on for from three hours and a half to four hours there were often only a few particles of matter not larger than the head of a pin, but they were almost always exceedingly rich in tubercle bacilli. In this way, what might be expected theoretically had been practically demonstrated; namely, that in the act of coughing, cows, as well as men, atomize, so to speak, their sputum, and project it into the air in minute particles, which may float for a considerable period of time. Secretions collected in this way had been inoculated into the peritoneal cavity of guinea pigs, and even when the bacilli could not be demonstrated under the microscope, a considerable proportion of positive results had been obtained. Dr. Ravenel did not mean to advocate this method as a means of diagnosis, although his experiments warranted him in believing that tubercle bacilli could always be found in the sputum of tuberculous animals at some time; but doubtless in early cases it would require a large number of examinations, and with the well-established use of tuberculin it would seem unnecessary to resort to this means. The danger of infection by means of this atomized sputum, so far as mankind is concerned, is confined practically to those in constant contact with the animals, but for other animals in the same stable, these particles must be considered a source of danger.

Of thirty-four examinations carried out on five different animals, tubercle bacilli were detected by microscopic examinations twenty times. The number of bacilli found varied greatly, but one of the five animals constantly coughed up a tenacious mucus in which the numbers approached those seen in human sputum from advanced cases.

During a period of time extending over forty-three days, mucus from cows was collected by means of the nose-bag, on eighteen days, and inoculated into the peritoneal cavity of forty-five guinea pigs. Of these, twenty-three had died within a few days, most of them from peritonitis, at a period too early for the development of tuberculous lesions. Subtracting these, there remained twenty-two animals, eleven of which, or fifty per cent, became tuberculous.

By means of a special nose-bag, guinea pigs were exposed directly to the breath of the cows in the sputum of which tubercle bacilli had been found. Fourteen guinea pigs were exposed for varying periods of time, as follows: Two guinea pigs, for two hours one day; two, for two hours and a half on one day; two, for three hours on one day; two, for five hours on two days; two, for fifteen hours on five days; two, for twenty-seven hours on nine days. These animals were killed after several weeks, but no evidence of tuberculosis could be detected in any of them.

The cows on which the examinations were carried out were all marked subjects of tuberculosis, though only one was in the last stage of the disease. One animal which gave a large proportion of positive results lived for more than two years after the experiment.

Intestinal Bacteria and Intestinal Poisons in the Brain as a Cause of Infantile Convulsions.—Intestinal disturbances have often been considered the cause of convulsions in children, but there has been very little direct proof that there is any real foundation for this belief, and the etiology of this condition has not been very satisfactorily explained. Johannes Seitz, of Zurich, in the *Correspondenz-Blatt für Schweizer Aerzte*, 1900, Vol. 30, p. 138, reports interesting observations on this subject, together with seven cases in which he has been able to demonstrate intestinal bacteria as a cause of brain symptoms. In this paper he reports at length the case of an infant that had suffered from gastrointestinal disturbances and constipation. After several attacks of convulsions, death resulted, and from the cerebrospinal fluid of the ventricles of the brain, Seitz was able to cultivate the bacillus coli communis, together with several other intestinal bacteria. For some time the strength of the little patient had enabled it to overcome this source of cerebral irritation, though the symptoms of vomiting, unrest, and pain were present, but sudden death resulted from respiratory and cardiac paralysis. Seitz mentions several publications in which he has called attention to this subject previously, the earliest publication having appeared in the same journal as the present publication, in 1895. In all, he has observed fifteen cases, in which he believes there was evidence of this origin of the cerebral symptoms, and in seven cases bacteria from the intestine were directly demonstrated. In the other cases it is quite possible that the symptoms were caused not by bacteria directly, but by bacterial poisons. The bacteria were discovered only after the most thorough examination, and they were usually present in small numbers. Staphylococci, streptococci, and members of the colon group were most frequently found.—*Philadelphia Medical Journal, Dec. 22, 1900.*

Destruction of Bacteria within the Body.— Radzievsky (*Centralbl. f. Bakt.*, Aug. 22, 1900) includes under the term "infection" all the effects which follow the entrance of micro-organisms into the animal body. All writers ascribe the most important changes to the action of specific poisons produced during the development of the infecting organism. Some, however, consider these poisons decomposition-products of the action of the organism on the tissues, while others have brought evidence to show that there is active poisonous matter in the living structure of the organisms themselves. This active poison is, according to some, secreted as a normal vital act of the organisms, while others believe that the appearance of the poison follows their decay and dissolution. Cantani and Pfeiffer believe that the organisms are killed by contact with living cells, and that the dead specimens are taken up and dissolved, the contained poison being thus carried into the circulation. Radzievsky has observed the course of events in fatal infection with bacillus coli. In the first stage the multiplication of organisms is in the ascendant; in the second stage their destruction is remarkable, and involves a steadily increasing number of examples. When a culture not specially virulent is injected, the number of living specimens is notably decreased before death. Bactericidal substances are formed which kill the microbes, and, the dead bodies being dissolved, the bacterial poison gains access to the general circulation, and produces the clinical signs of infection. The destruction of the microbes is extra-cellular in the fluid elements of the tissue. The microscopical changes found after infection with a dead culture are the same as those to be observed in infection with living organisms. The writer's observations point to there being important toxic substances in the structure of bacteria which are largely responsible, when the latter are killed and dissolved, for the clinical signs of infection.

A New Thread Bacterium Causing a Pseudo-Actinomycotic Affection.—Dr. Cozzolino (*Zeitsch. f. Hyg. u. Infect.*, XXXVIII, p. 36; Ref. *Schmidt's Jahrb.*), in the pus and organs of a woman dead of a disease running the clinical course of actinomycosis, found a new thread bacterium which he carefully describes. It was pathogenic for guinea pigs and the common house mouse. It could not be identified with the other species described as causative agents in pseudo-actinomycosis.—*Post-Graduate, November, 1900.*

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COCOA WINE AND THE COCAIN HABIT.

DISEASED conditions resulting from the toxic effect of cocain are a comparatively new addition to the list of pathological states recognized in this country, although for many years numerous examples of the evil effects of this drug have been recognized among the cocoa chewers, or *coqueros*, of Peru, where the habit of chewing the cocoa leaf is exceedingly prevalent. The use of cocain in various forms is becoming increasingly common in this country. Not only cocoa wines, but various preparations recommended for catarrh, and a considerable number of nostrums of various sorts contain this drug in quantities sufficient to produce most baneful effects. It is one of the most delusive of drugs. The first effects produced by small quantities of it are highly agreeable. Even dogs and other animals when subjected to its influence show decided evidence of exhilaration and delight.

This poison, as is well known, is one of the most pernicious of the entire list of enslaving drugs. Its use not infrequently leads to the opium habit or to chronic alcoholism; and not infrequently, on the other hand, persons who have been addicted to the morphia or the liquor habit have been led to abandon the use of these drugs for the more enjoyable and fascinating excitement of cocain.

This question is one of the most profound importance, and ought to receive the careful attention of all intelligent medical men. Laws should be enacted prohibiting the sale of patent nostrums containing cocain, and physicians should cease to recommend for habitual use those wines and other preparations known to contain this drug. The temporary exhilaration and the relief from mental or muscular fatigue obtained in this way are in the highest degree delusive, and only enable the patient to pursue a little farther the course of life which is exhausting his vital energies, and which demands rest and restorative treatment rather than the use of a drug which merely benumbs his sensibilities, and hides from him his real condition. No physiological or other experiments have ever been adduced to show that the use of cocain or any similar drug actually increases the dynamic capacity of the body. The only thing these narcotic or so-called stimulating drugs can do is to lessen the sense of fatigue by benumbing the nerve centers or the nerves in which this sense resides, or by increasing the patient's facility for expending his energies, which in many cases in which this drug is used, are already too far spent, and demand replenishment rather than further depletion.

The rational therapeutic course for the majority of persons who seek refuge in cocoa wines and similar drugs will be found in the application of scientific hydropathy, especially carefully graduated cold baths, life out of doors, a simple, easily digestible dietary, and rest from care, worry, and fatiguing work. The mere antidoting of symptoms or hiding of the pathological conditions by the use of such a delusive drug as cocain, can hardly be looked upon as scientific medical practice.

SLEEPING-CAR HYGIENE.

THERE is no country in the world in which sleeping cars are used so extensively as in the United States, and hence none in which there should be so great an interest in hygiene as it relates to the

management of sleeping cars. Strange to say, however, very little consideration seems to have been given this question. In conversation with a sleeping-car conductor some time ago, the writer remarked upon the possibility of infection with tuberculosis through the medium of contaminated blankets. The conductor remarked that he was personally apprehensive on the same ground, and that he always took pains, by carefully folding a sheet over the blankets, to protect his face and mouth thoroughly from contact with them. He said he instructed his porters always to arrange the sheets in this way, so that healthy passengers might run as little risk as possible through infected blankets. The conductor stated that the sheets are, of course, washed each time they are used, and that cars are thoroughly renovated at the end of each long trip, but admitted that the blankets are disinfected not oftener than once in three to six months.

Of the two hundred thousand consumptives in the United States, many thousands are constantly traveling in sleeping cars. Those who follow them, occupying the same berths, are certainly exposed to the most effective means of contagion. An examination of the dust of sleeping cars by Koch and other bacteriologists has revealed the presence of the tubercle germ in considerable numbers, and there can be no doubt that susceptible persons are often contaminated in this way. Cushions, curtains, and other appurtenances of sleeping cars, as well as blankets, carry contagion. Probably the greatest danger of all is to be met in the sleeping-car dust which many porters manage to keep constantly afloat in the air by the frequent and vigorous use of the duster. It is the writer's opinion that this is a matter to which the State Board of Health should give immediate attention, and that laws should be enacted in every State prohibiting the use of the feather duster or any equivalent means of stirring up dust in sleeping cars. The dust should, of course, be removed, but by means of a damp cloth, instead of a duster, and the dirt and dust of the floor should be wiped up with a cloth, instead of being swept the whole length of the car with a broom, filling the entire car with dust consisting largely of dried spittle and other germ-laden material.

There is also ground for believing that too little attention is given to the character of the water with which the drinking tanks of sleeping cars, as well as day coaches, are supplied. The tender, the wash-water tanks, and the drinking-water tanks are in many instances supplied from the same source, and for the most part these sources of water supply are under no sanitary supervision whatever, except such as may be given by ignorant laborers, who have no better conception of hygienic matters than did a New York health officer, mentioned by Professor White, of Cornell University, who pronounced the word "hygienics" as if spelled "hijinnicks," and defined it as "a bad smell arising from dirty water." The writer has met a number of cases of dysentery and a few cases of typhoid fever in which he has had reason to believe that the source of contamination was the use of water supplied by the drinking tanks on trains and in railway waiting-rooms.

MOSQUITOES AND YELLOW FEVER.

A COMMISSION sent out by the United States government to Havana to study the cause of yellow fever has presented an exceedingly interesting report. Encouraged by the results obtained in the study of the relation of mosquitoes to malarial disease, they made a large number of experiments with them for the purpose of determining, if possible, whether or not they play any important part in the etiology of yellow fever. The evidence presented established clearly that "the mosquito serves as an intermediate host

for the parasite of yellow-fever." A little more explicitly stated, the conclusion is simply that the mosquito may by biting a yellow-fever patient take into its body a considerable number of yellow-fever parasites, which may afterward, in the same manner, be communicated to a healthy person, in whose body these minute parasites will grow until all the characteristic phenomena of yellow fever are developed. Several persons were made sick by experimental bites of mosquitoes which had bitten yellow-fever patients, and one member of the commission, accidentally bitten while visiting a yellow-fever patient, contracted the disease and died. The variety of mosquito which was found to be the vehicle of the disease is that known as *culex fasciatus*. It is important that those who live in tropical or mosquito-infested regions should know these facts, that they may be careful to avoid the bites of these persistent little persecutors which have for so many generations plied their nefarious occupation without arousing suspicion as to its grave significance.

SAND FILTRATION OF CITY WATER SUPPLIES.

SAND filtration is an excellent method of dealing with large water supplies obtained from such natural sources as creeks, rivers, and lakes. Such water always contains many injurious impurities, even though disease germs may not be present. Fragments of dead fish, small minnows, minute animal and vegetable organisms, and various other elements of pollution are found in greater or less quantities in all waters obtained from running streams or lakes. Multitudes of germs of various sorts, which are capable of producing dysentery, diarrhea, suppuration, and indigestion, to say nothing of the colon bacillus, typhoid fever bacillus, and other specific pathogenic organisms, are also frequently found in these waters. All these may be removed by simply passing the water through a bed of sand properly prepared. An acre of sand filter arranged on the Gravitz system will filter well three million gallons of water every twenty-four hours. This method is much preferred to the so-called rapid mechanical method, for the reason that it is not only more economical, but more certain to secure the best results.

This subject ought to be agitated in every city which has a public water supply obtained from rivers or brooks. Such sources are certain sooner or later to be contaminated to a greater or less degree. Attention to this matter will save annually many hundreds of lives out every million, by securing a pure water supply.

A word should be added, perhaps, by way of explanation. It is an established fact, though not generally known, that sand filters do not depend to any considerable degree for their purifying properties upon the mechanical separation of the impurities, but upon their destruction by the multitudes of infusoria which form a slimy covering over the filter-bed, and which capture the germs of all sorts, allowing none to escape when the process is rightly managed.

DIRTY PORTO RICO.

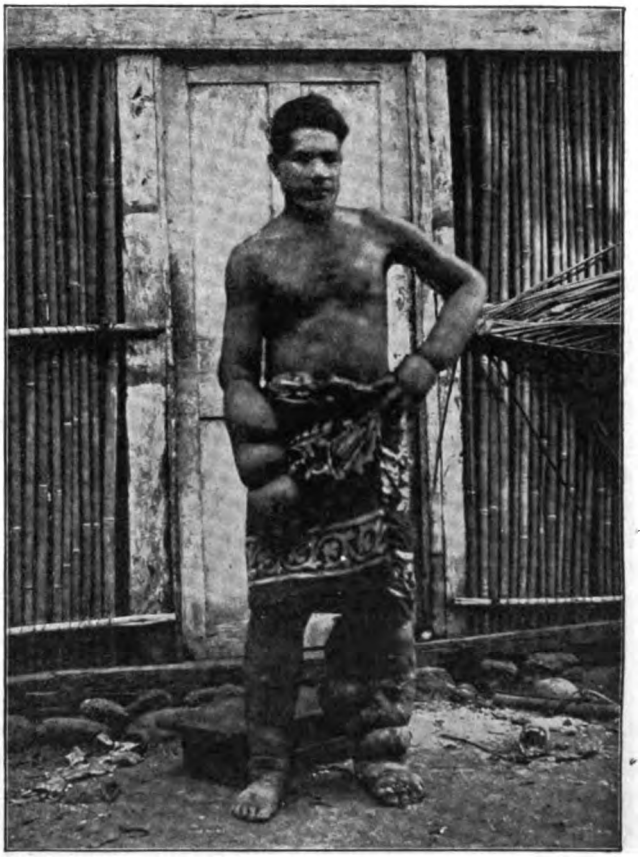
A SANITARY officer, who has been on duty for some months in Porto Rico, reports that the terribly high death-rate of that country which has attracted not a little attention, is unquestionably due to the almost utter neglect of sanitation. There, animal as well as human excreta is thrown directly into the rivers, which are also used as the common wash-tub for the adjacent population, for bathing, and as a depository for filth of every description. Pigpens are built in the edge of the stream or near it. Out of these same rivers the supply of drinking water is obtained.

Porto Rico is one of the most thickly settled countries in the world, so that contamination of the water supply must be very great. Anemia due to a parasite known as the *anchylostomum* is the most common cause of death. The parasite is obtained through contaminated water. The eggs of the parasite escape into the water from the bodies of persons affected with it. These eggs are taken into the alimentary canal of other persons by use of the water for drinking purposes, and thus the contamination has been extended, until at the present time a large percentage of the inhabitants are suffering from this parasitic malady. There is just now great opportunity for missionary sanitarians and physicians to do a noble work in the elevation of this long-oppressed and benighted country.

MOSQUITOES AND ELEPHANTIASIS.

In various tropical regions, particularly in the South Sea Islands and certain portions of Africa, a most distressing disease known as elephantiasis is becoming more and more prevalent. In this malady the skin of the portion of the body affected often becomes greatly thickened, the part sometimes assuming enormous proportions. The accompanying cut shows the appearance of the legs of a person suffering with this disease. This malady has seldom been met with in this country, but the writer has encountered a few cases in the course of a medical experience of over twenty-five years.

A commission was recently sent out from the Liverpool School of Tropical Medicine to study the disease in Nigeria. The report of the commission, recently made, shows that this disease is produced by a parasite which, like that of malaria, is communicated to human beings by the mosquito. At present three diseases are known to be produced by this insignificant little insect,—malaria, yellow fever, and elephantiasis. All of these are grave maladies, and it seems almost incredible that their connection with the mosquito has remained so long undiscovered.



PUBLIC-HEALTH INTERESTS IN MICHIGAN.

Every intelligent resident of Michigan must be interested in the public health of this great State, and every such one should make it a matter of personal concern to investigate the work done by the State Board of Health. The efficiency of this work has largely been due to the ef-

forts of the distinguished Secretary, Dr. H. B. Baker, who is recognized throughout the whole civilized world as one of the foremost sanitarians of the day. No greater calamity could befall the State of Michigan than the removal of such a faithful and efficient man from his office so long as he is able to serve his fellowmen so ably and successfully as Dr. Baker has done during the last thirty years or more. The writer's personal acquaintance with the work of the State Board of Health permits him to speak thus freely and confidently, and leads him to express the hope that the newly elected governor will see to it that any scheme which may be on foot looking toward the termination of the labors of Dr. Baker in connection with the State Board of Health will be quashed forthwith, and that in the selection of two new members who are to be appointed in the near future to fill vacancies occasioned by expiring terms, such men may be placed upon the Board as will perform the duties in an intelligent way and with entire freedom from personal bias or selfish aims.

SOME SIGNIFICANT STATISTICS.

THE table of death-rates for the third quarter of the year 1900, as compiled by the *Sanitarian*, presents some very significant figures. For example, the death-rate of Cairo, Egypt, is 46.9 per thousand. At Bombay, at that time suffering from the plague and cholera, the death-rate was 101.9; in St. Petersburg, 26.9. In most Continental cities the death-rate runs from 20 to 30, often exceeding the latter figure, rising at Havre, France, to 41.1.

American reports make a much better showing. For example, the death-rate reported for Boston is 21.9; Baltimore, 17.2; for the State of Michigan, 13.8. In St. Paul, Minn., the death-rate is still lower, reaching only 10.4.

The low death-rate of Michigan and Minnesota is doubtless due to the fact that in these States there are few large centers of population. The majority of the people live in cities of moderate or small size or in the country, and are thus much less exposed to the causes of disease than are those who live in the crowded centers.

A New Contagious Disease among Cattle.— Dr. Bracken, of Minnesota, at the recent meeting of the American Public Health Association, told of having discovered several outbreaks of hemorrhagic septicemia, also meningitis, among American cattle. Septicemia is caused by the same germ which gives rise to chicken cholera. It is unquestionably a fact that disease among animals is rapidly increasing, and at present it is not easy to make certain that the juicy and tender beefsteak which the meat eater consumes at the breakfast table is not in any particular instance filled with infectious germs and toxins and ptomains which may be in the highest degree productive of disease

The Plague in California.— Notwithstanding the efforts of the State Board of Health of California to cover up the fact, it is generally believed by sanitarians that the plague has existed in Chinatown, San Francisco, for more than six months. Three cases were reported last October, and the disease may still be in progress in that sink of iniquity which the health authorities of the Western metropolis still unwisely tolerate within the borders of the beautiful City of the Golden Gate.

Sunlight and Tubercle Bacilli.— Drs. Mitchell and Crouch, of Denver, Colo., have demonstrated that tubercle bacilli are destroyed by thirty-six hours' exposure to sunlight under the conditions in which the germs are found when expectorated upon sandy soil.

The Battle Creek Sanitarium

LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
NEWTON EVANS, M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR DECEMBER.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
103 per cent.	7	2	9
100 " "	63	27	90
95 " "	21	14	35
93 " "	1	8	9
92 " "	1		1
88 " "	3	3	6
85 " "	8	11	19
83 " "	1		1
78 " "		3	3
73 " "	1	3	4
Below 71 per cent.	5	12	17
Total	111	73	194

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	33	8	41
Between 4,500,000 and 5,000,000	35	14	49
" 4,000,000 " 4,500,000	22	29	51
" 3,500,000 " 4,000,000	7	3	10
" 3,000,000 " 3,500,000	4	3	7
" 2,500,000 " 3,000,000	3	4	7
Below 2,500,000	6	15	21
Total	110	76	186

Examination of Sputum.— There were 24 examinations made, 23 being new cases. Tubercle bacilli were found in 3 cases.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	30	73	7	58	37	53	74	60
Less than 10,000 bac.	11	27	4	33	22	32	37	30
Between 10,000 and 100,000 bac.			1	9	6	8	7	5
More than 100,000 bac.					5	7	5	5
Total	41	100	12	100	70	100	123	100

The patients were received from the following States and countries: Michigan, 20; Ohio, 10; Indiana, 19; Illinois, 14; Iowa, 8; Tennessee, 4; Wisconsin, 5; New York, 4; Missouri, 2; Minnesota, 2; Kansas, 4; Kentucky, 4; Pennsylvania, 4; South Dakota, 3; Montana, 1; California, 6; Canada, 5; Utah, 2; Massachusetts, 2; Sweden, 1; New Jersey, 3. Total, 123.

Urinary Laboratory.—Total number of specimens examined, 646; number of new cases, 215; number of cases having pus, 92; albumin, 14; sugar, 9; casts, 6; blood, 3.

THE PRINCIPLES OF BACTERIOLOGY: A PRACTICAL MANUAL FOR STUDENTS AND PHYSICIANS.— By A. C. Abbott, M. D., Professor of Hygiene, and Director of the Laboratory of Hygiene, University of Pennsylvania. Fifth edition, enlarged and thoroughly revised, with 109 illustrations, of which 26 are colored. Lea Brothers & Co., Philadelphia and New York, 1899.

The necessity of a fifth edition of this work within two years of the publication of the fourth edition testifies to its popularity and worth. Many new and valuable facts pertaining to the science of bacteriology have been developed within the past two or three years, and the author, in order to supply the student of bacteriology with them, has thoroughly revised the fourth edition of his work, adding thereto a number of new illustrations, and the latest facts pertaining to technique, disinfection, the specific infections, immunity, etc.

The work is written in a concise and comprehensive manner, and is one of special value to students of bacteriology.

PAMPHLETS RECEIVED.— "Abdominal versus Vaginal Hysterectomy." Henry O. Walker, M. D., Detroit, Mich.

"INNOCENTS ABROAD."

Doctor (to patient about to take a lavage)— "Madam, if you have any artificial teeth, will you please remove them before I undertake to pass the tube."

Patient (after removing two plates of artificial teeth) — "Will it be necessary for me to remove my glass eye?"

Pigarians !

THE late Dr. Oliver Wendell Holmes declared that he could tell the man who made free use of pork by the looks of him; that his face had a sort of hoggish expression, while his hair resembled bristles. Bronson Alcott, the Concord Philosopher, speaking in the same tone, declared that the man who eats pig becomes piggified.

Both of these confirm the truth of the old German proverb, "As a man eateth so is he." The enormous consumption of pig is unquestionably molding the natural character in an undesirable way. If it was not a custom handed down from barbarous times, and to which man's stomach is accustomed, nothing short of threatened starvation would induce a sane human being to eat pork. Now that scientific research has brought forward

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MODERN MEDICINE

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ORIGINAL ARTICLES.

THE BACTERIOLOGY OF THE STOMACH.[1]

BY J. H. KELLOGG, M. D.,

Superintendent of the Battle Creek, Mich., Sanitarium.

THE great service which has been rendered by chemical examinations of the stomach fluids by the methods developed by Golding, Bird, Hayem and Winter, Tœpfer, and others, has to a considerable degree diverted attention from the recent results of laboratory researches pertaining to the bacteriology of the stomach. Abelous was one of the first to make a careful study of the microbes found in the mouth and the stomach. Gillespie later took up the study. Some eight years ago the writer, recognizing the inadequacy of chemical methods as a complete guide to therapeutics and in the treatment of gastric disorders, began a systematic bacteriological examination of the gastric contents obtained after a modified Ewald test meal. Several years previously (1892), there was begun a systematic chemical examination of stomach fluids in all cases requiring an investigation of this kind, employing the exhaustive method of Hayem and Winter, with which the method of Tœpfer has since been combined, obtaining more accurate data respecting the fatty acids and neutral chlorine compounds.

Over 15,000 stomach fluids have been examined in the laboratory of which I have charge, by the combined method which I have devised, which also includes a determination of the quantity of soluble completely converted carbohydrates, as also of various coefficients related to gastric work.

After a careful study of several thousand of these cases, I became convinced that further information must be obtained to make possible an exact adaptation of therapeutic measures, especially in dealing with the more intractable forms of gastric disorders. After careful study of the work of my predecessors in this line of research, and with the aid of the technical skill and experience of my friend Dr. Novy, of the University of Michigan, and assistants especially trained for the purpose, I elaborated a plan for the examination of stomach fluids with reference to practical gastric therapeutics. The object sought was not so much to identify known organisms or to discover new ones, but to obtain practical therapeutic indications. The information sought included especially the following data: —

1. The number of bacteria or spores or yeast or mold present per cubic centimeter of stomach fluid.
2. The presence or absence of gas-forming bacteria.
3. The presence or absence of acid-forming bacteria.
4. The presence or absence of gelatin-liquefying bacteria.
5. The relative toxicity of the products of the parasitic organisms found in the stomach fluid.

Some of the earlier results obtained by this method I presented in a paper read before the New York Academy of Medicine some three or four years ago. Most of the facts here presented were given in a paper read before the Medical Society of my own State (Michigan) at its last annual meeting.

It is not necessary to describe in detail the technique of the methods employed. The number of microber is determined by counting the number of colonies found in a plate-culture containing one cubic centimeter of stomach fluid diluted with a known quantity of culture-media. The formation of acid and the presence or

[1] Read by invitation by Dr. Read for the writer before the Medical Society of Virginia during its Thirty-first Annual Session in Charlottesville, Va., Oct. 25, 1900; and reprinted from the *Virginia Medical Semi-Monthly* of Dec. 21, 1900.

absence of gelatin-liquefying bacteria are observed in the usual way. For the determination of the relative toxicity, an intravenous injection of rabbits and guinea pigs was made with a culture obtained by inoculating six ounces of sterilized bouillon. In some instances, inoculation of guinea pigs was practiced by intraperitoneal injection of a bouillon culture. The toxicity-determination was not made in an ordinary examination, but only in special cases as a means of determining the origin of toxic matters giving rise to a state of general toxemia often present. The relative number of aerobic and anaerobic bacteria is determined by the use of a culture-chamber devised by Professor Novy.

Various culture-media, such as fruit juices and the various vegetable products, have been employed in addition to the regular laboratory media. Numerous researches of various sorts have also been undertaken for the purpose of determining the various sorts of foods in relation to bacterial development in the stomach, and other questions of interest.

The bacteriological examination above briefly described has been made in several thousand stomach fluids, in the laboratory of which I have charge; always in connection with an exhaustive chemical examination of the same stomach fluid.

It is the purpose of this paper to present briefly the results obtained and the conclusion arrived at from a study of the data afforded by these examinations. A point of cardinal interest and which has been found to be of the greatest therapeutic value, is the number of bacteria found present.

Of the total number of stomach fluids examined bacteriologically (8,042), 2,320, or 28.8 per cent, were found to contain bacteria. These were divided among the different classes,— hyperpepsia, hypopepsia, simple dyspepsia, and apepsia,— as follows: —

Hyperpepsia	461 or 10.8	per cent.
Hypopepsia	1,712 or 73.7	"
Simple dyspepsia	135 or 5.8	"
Apepsia	12 or .5	"

Of the total number of infected fluids, 805, or about one fourth, contained more than 100,000 bacteria per cubic centimeter, and in 198 cases, or 8.5 per cent, the number of bacteria per cubic centimeter was found to be one million or more. The highest number counted was thirty-three million; but in 128 cases, or 5.5 per cent, the plate was completely overgrown. As examples of the large number of bacteria found in some cases, I present the following, in which I have also given in tabulated form the results of chemical examinations: —

No.	Bacteria. Aerobic.	Bacteria. Anaerobic.	Total Acidity.	Calcul. Acidity.	Hcl.	Soluble Carbohydrates.
13,525	33,000,000	.....	.024	.050	.000	6.600
.....	1,000,000	790,000	.196	.028	.000	5.660
10,471	16,400,000	12,000,000	.026	.014	.000	3.000
9,457	6,000,000	.....	.246	.308	.088	5.560
.....	175,000	.....	.018	.048	.000	9.660
6,917	500,000	.....	.004	.048	.000	5.980
.....	100,000	.....	.030	.020	.000	6.480
.....	11,200,000	.....	.004	.066	.000	8.480
14,001	2,500,000	8,500,000	.112	.116	.000	.280
13,975	3,980,000	.....	.020	.019	.000	1.080
13,936	5,520,000	.....	.672	.080	.000	4.860
7,002	4,000,000	.....	.066	.046	.000	7.860
10,827	3,600,000	.....	.100	.098	.000	.800
11,372	3,100,000	.....	.012	.032	.000	8.090
10,246	2,439,000	.....	.014	.014	.000	1.720
.....	72,000	.....	.060	.080	.000	6.334
11,072	2,160,000	.....	.110	.119	.000	6.052
10,497	1,080,000	.....	.012	.144	.000	8.6858
.....	216,000	....	.004	.010	.0 0	4.500
13,269	1,800,000	.....	.196	.212	.126	.....
7,196	1,600,000	....	.022	.060	.000	9.100

Of the 2,928 cases the percentage of stomach fluids infected to the extent of 100,000 or more bacteria to the cubic centimeter of stomach fluids found in the several classes above mentioned, was as follows: —

Class.	No. Cases.	No. containing 100,000 or more to c.c.	Per Cent.
Hyperpepsia	3,389	129.	13.6
Hypopepsia	3,924	665.	43.6
Simple Dyspepsia...	716	1.6	18.8

The most important fact brought out by this study is, I think, the large number of perfectly sterile stomach fluids. Of the total number counted as infected, 682, or more than one third, contained less than 10,000 colonies. Such cases I have not regarded as pathological, but considered the infection as accidental, and having no particular significance. In 821 cases, or nearly one half, the number of bacteria found present was less than 100,000. I have considered it very questionable whether in such cases the infection might not be accidental, or if not accidental, at least possessed of little or no pathological significance.

We have left barely one tenth of the total number examined, in which the number of bacteria per cubic centimeter was found so great that it may be considered an etiological factor in the diseased conditions present in the stomach or in the system at large. These facts are greatly at variance with opinions very widely held respecting the relation of bacteria to digestion. Pasteur held that microbes play an essential part in the chemistry of digestion. Abelous, finding that certain bacteria isolated from the stomach were capable of coagulating milk, dissolving the coagulum as well as coagulated egg fibrin and gluten, while others manifested a diastatic action upon starch, concluded that bacteria are useful in the production of peptones from proteids, and sugar from starch. Schottelina, in his experiments upon chicks hatched in sterile chambers, concluded that bacteria are necessary to a healthy growth of chicks, for the reason that chicks subjected to the experiment gained weight very slowly as compared with chicks hatched and reared under ordinary conditions, — a conclusion evidently not wholly justified by the premises, since there are other important factors contributing to the good health of chickens living under normal conditions, besides the presence of bacteria. Mc Fayden, Nencki, and Seiber, in observations made upon a woman suffering from an intestinal fistula, observed that "no putrefaction of proteids occurred in the small intestine." They concluded, as the result of their observation, that bacteria did not produce peptones, and that "digestion could proceed to greater advantage without their presence." Gillespie, in his remarkable work, "The Natural History of Digestion," calls attention to the fact that although bacteria are capable of producing peptones which closely resemble the products of normal digestion, the peptones of bacterial origin differ in the fact that further changes take place as the result of which ammonia, amines, fatty acids, sometimes indol and skatol, are produced. The mere fact that gelatin and other proteids are liquefied by bacteria does not prove the utility of these organisms in digestion. The process is one of putrefaction, and not one of normal digestion. DuClaux, several years ago (1885), showed that beans and other plants germinated and grew readily in a soil rich in organic matter, though wholly free from microbes. His observations led him to the conclusion that, from a biological standpoint, the nutritive life of the young plant does not differ radically from that of the young animal. Nuttle and Theirfelder proved the correctness of DuClaux's position by rearing a guinea pig under aseptic conditions. The animal was taken from its mother by Cæsarean section performed aseptically, and placed in an ingeniously constructed apparatus, in which it could be aseptically cared for, fed, and supplied with water and air, without the admission of a single microbe. The little animal soon accustomed itself to its glass house, its feeding nipple, and the other conditions which surrounded it, and thrived so well that at the end of eight days, during which time it had consumed thirty-five grams of food, it was found to have gained ten grams in weight. This showed a gain over its brothers, which had been nourished under the ordinary conditions, being fed with nonsterilized milk, and breathing ordinary air. Not a single bacterium was found in its alimentary canal by a most careful search, every tube inoculated remaining sterile.

That microbes are commonly found in the stomach when empty, that is, when it contains neither food nor gastric juice, is well known. It is also indisputable that bacteria are commonly present in great numbers in the stomach during the digestion of ordinary food. The fact that bacteria are derived from the food in a majority of cases is clearly shown by a large number of cases in which bacteria and micro-organisms of all sorts have been found wholly absent, as before stated. An examination, made after a test meal, shows bacteria to be present in the stomach for the reason that nearly all food, even bread, contains living bacteria in great numbers. In the examinations the results of which are reported in this paper, the test meal consisted of thoroughly sterilized material. When ordinary bread is used, plenty of microbes are found at the end of the first hour of digestion, although, as Gillespie has pointed out, the number of microbes steadily diminishes after the first hour. At the end of the fourth hour he found only one or two colonies in a plate-culture in which the number at the end of the first hour was "practically innumerable."

My observations establish clearly, I think, the fact that when the food is sterile, the process of stomach digestion is carried on without the presence of bacteria. Molds and yeast added to the sterile test meal nearly always appeared in the plate-cultures, although there was no evidence of growth in the case of molds.

An interesting fact, to which attention should be called, is the considerable number of cases of hyperpepsia in which the stomach fluid was found highly infected. The percentage is small, it is true, compared with the number of cases of hyperpepsia and apepsia, but, nevertheless, the number is sufficiently large to indicate clearly that the gastric juice alone is not a perfect antiseptic. I called attention to this fact in a paper read before the New York Academy of Medicine some years ago, and cited a considerable number of cases in illustration.

Several years ago Gillespie called attention to the fact that free hydrochloric acid combined with proteids has very little inhibitory effect upon the growth of micro-organisms. He also noted that free hydrochloric acid is more active in the presence of combined chlorine than in its absence. The writer knows of one case (10,301), that of a man, in whom the amount of free hydrochloric acid found present was .074, with combined chlorine to the amount of .242, notwithstanding the bacteriological examination showed 1,050,000 bacteria present in one cubic centimeter of stomach fluid.

The antiseptic power of the stomach does not depend alone upon the hydrochloric acid. The mucous membrane of the stomach, like that of the mouth, lungs, the nasal cavity, and other mucous surfaces, together with all the living cells of the organism, has the power, when in a state of health, to resist the growth of micro-organisms. The normal stomach is inhospitable to bacteria. When the general vital resistance is lowered, as indicated by coated tongue and decayed teeth, for example, the stomach is likely also to be deteriorated to such a degree that its resisting power to micro-organisms is lost. These parasites take up their abode in the stomach, and by producing various putrefactive and fermentative changes in the food substances, become a source of toxins which may be produced in such enormous quantities as completely to overwhelm the body, producing the conditions known as chronic toxemia, pernicious anemia, and many other obscure systemic conditions. It is more than probable that Bright's disease, hepatic cirrhosis, atheroma, and various degenerations of the nervous system and other structures resulting in partial or complete loss of function, have their origin in subtile toxins derived from the alimentary canal, as Dana, Bouchard, and others have so clearly pointed out.

The most important therapeutic deduction which I have drawn from my observations has been the value of a fruit dietary as a means of sterilizing the stomach. Some four years ago, by the aid of my able assistant, Dr. George B. Burleigh, I first conducted a series of experiments for the purpose of determining the influence of organic fruit acids upon the growth of bacteria found present in the stomach fluid. In more recent study of the subject, the technical work has been most conscientiously done by my colleague, Dr. Frank Otis. In observations made, it was at once clearly apparent that the growth of micro-organisms was strongly inhibited,—lemon, lime, orange, strawberry, apple juices, and the juices of various other fruits not only preventing the growth of ordinary micro-organisms which are found in the stomach, but actually destroying such vigorous pathogenic organisms as the typhoid bacillus, the colon bacillus, and the bacillus of Asiatic cholera.

I recognized at once that these results afforded a complete and satisfactory explanation of the marvelous influence of a fruit diet in various infected conditions long recognized in the treatment of certain forms of gastric and intestinal disorders, which have given rise to the systematic employment of the so-called "grape cure." This cure has been practiced in Switzerland and Italy and other continental countries from the most ancient times, and more recently in California and Ohio. Accounts have appeared at various times in medical literature of the use of peaches, apples, and other fruits with equal success.

I at once made a practical application of the observation made, in the treatment of cases requiring sterilization of the alimentary canal. For some time before this observation was made, I had made it an invariable rule to employ systematic lavage every other day or once or twice a

week, according to the number of microbes found in the stomach fluid, or the persistency of the infection. It occurred to me that by the employment of fruit juices and a fruit dietary, the use of the stomach tube might be very largely dispensed with. Now, after three years' trial of this method, during which time I have employed it in the treatment of hundreds of cases, I am able to say that the use of the stomach tube other than as a means of diagnosis is almost altogether unnecessary, except in cases in which there exist extensive diverticula or organic obstruction of the pylorus.

In a patient recently under treatment, a physician (No. 14,225), the count of microbes in less than a month was reduced from 5,340,000 aerobes and 2,435,000 anaerobes to 18,000 anaerobes and 32,000 aerobes, a nearly sterile state. In this case the stomach was temporarily completely sterilized by a sterilized test meal consisting of ten ounces of strawberries and nine ounces of water. Kitasato and Van Ermengen showed several years ago that citric acid has a powerful germicidal property, even destroying the cholera spirillum and the typhoid bacillus in solutions having a strength of less than one half of one per cent. According to Kitasato, malic acid, the acid of apples and most other fruits, is equally efficient with citric acid in the destruction of micro-organisms. These facts have long been known, and it is surprising that a more general use has not been made of this valuable fact. More than a century ago Dr. Dwight reported cases of sick headache successfully treated by the patient's drinking a glass of good cider before each meal. I have had equally good success in the treatment of this class of cases by having the patient swallow eight to sixteen ounces of orange juice half an hour before each meal, at the same time, of course, regulating the dietary by the exclusion of foods which abound in micro-organisms, such as cheese, fermented bread, butter, and milk. In cases in which a high degree of infection exists, that is, in which the count of microbes is very large, a million or more, the antiseptic dietary of Dujardin-Beaumetz is clearly indicated. The influence of infected food is easily shown experimentally. For example, in one case in which I administered scraped beef, prepared and cooked in the usual way, the bacteriological examination of the stomach fluid showed 788,580 colonies, although in a sterile test meal no colonies were found. In this same case a test meal of cheese gave 17,000,000 colonies for one ounce of stomach fluid. In the worst cases it is necessary to prohibit not only germ-containing foods, like cheese and raw milk, but foods which encourage the development of germs, such as meat, eggs, milk, even though boiled, and coarse vegetables, when the motility is deficient. Bouchard has shown that food retained more than five hours in the stomach undergoes putrefactive and fermentative changes through bacterial growth.

In the therapeutic employment of a fruit dietary, any acid fruit may be taken. Fresh fruit is more effective than cooked fruit, but cooked fruit is nevertheless efficient. In my experiments, fresh fruit appeared to be more active in suppressing bacterial growth than cooked fruit, although the latter is highly efficient. A good plan, commonly employed in cases in which the stomach fluid is found infected to a high degree, is to put the patient upon an exclusive fruit dietary for a period of time varying from two days to a week, according to the patient's vigor and the influence of the dietary upon his strength. The exclusive fruit dietary is of course a sort of mild starvation, since fruit consists so largely of water that it is impossible for a patient to eat a sufficient quantity of any ordinary fruit to furnish the twenty ounces of water-free nutrient material required for daily sustenance. The patient may be allowed to eat as much fruit as he likes. The fruit should be served to the patient in regular meals, but at shorter intervals than when ordinary foods are employed. At least four, and, if desirable, five meals may be taken at intervals of four or five hours. Ripe fresh fruit or stewed fruit leaves the stomach, according to Beaumont's observations, in one and a half to two hours. A variety of fruit should be employed, so that the patient may be encouraged to eat freely. If there is noticeable weakness, the patient may take with his fruit, twice a day, two or three ounces of zwieback thoroughly browned or a browned granose biscuit. It is better to take the dry food first, the fruit afterward, so as to insure thorough mastication and insalivation. Ripe bananas, although possessed of no marked germicidal power

and even ripe olives, may be used in connection with a fruit dietary with advantage. After the patient has been confined to an exclusive fruit dietary for the desired length of time, he should be placed upon a modified fruit diet, which may be managed in any one of several ways, as may be best suited to the requirements of the case.

A plan that works well in many cases is to give the patient two fruit meals and one meal consisting chiefly of fruits, grains, and nuts, avoiding meats and milk. The mixed meal should be taken in the middle of the day, the morning and evening meals consisting wholly of fruits. Or the breakfast and dinner may consist of mixed foods, while fruit only is taken at the evening meal. The interval between breakfast and dinner should be not less than six hours, while an interval of seven hours is better.

Another plan is to require the patient to live wholly upon fruit for one day each week. The effect of a few days' exclusive fruit dietary in the developing of a natural appetite, improving the vigor of digestion, regulating the bowels, and relieving the somewhat vague, but nevertheless distressing symptoms which the patient generally describes under the term "biliousness," is most gratifying to both patient and physician.

The popular idea that fruit is difficult of digestion is based upon a lack of knowledge respecting the proper use of fruit. It is the combination, and not the fruit, which does the mischief. Fruits do not agree either with vegetables or with meats, but agree perfectly with grains, especially when the latter are taken in a dry form, as toasted bread, zwieback, etc., and are thoroughly masticated. In the writer's opinion, the therapeutic value of fruit is beyond estimate. Fruit is a natural intestinal antiseptic. A fruit diet for a few days may be relied upon to relieve an attack of so-called "biliousness." The adoption of a fruit diet when an attack of migraine, or sick headache, is impending, will generally abort the attack, if it does not altogether prevent it.

I have found many persons who declared that they could not digest fruits. Inquiry has almost invariably shown the cause to be the admixture of fruit with various other substances with which fruit is incompatible, as coarse foods, meats, rich gravies, ice cream, and similar indigestibles. Occasionally, acid fruits are found to be badly borne in cases of gastric ulcer and gastric catarrh; but even in these cases the patient may be gradually trained to tolerate a fruit dietary without difficulty. In cases of hyperpepsia, acid fruits should not be taken at the beginning of the meal, but the cereal preparations should be taken first. A half hour later, acid fruits may generally be taken without difficulty. This restriction is necessary because of the fact, which has been demonstrated by an elaborate series of experiments, that organic acids of all sorts interfere with the digestion of cereal foods in the stomach. As the amylolytic action of the healthy stomach terminates at the end of thirty to forty minutes, fruit may be taken at the end of this period without interfering with the digestion of starch.

As a practical suggestion, it should be added that fruit juices for antiseptic purposes should be taken without sugar, or with the addition of as little sugar as possible, since Brandel has shown that solutions containing more than ten per cent of cane sugar are capable of producing marked irritation of the gastric mucous membrane, thus lessening the normal resistance of the stomach, inducing catarrh, and promoting the growth of micro-organisms.

In conclusion, the results of the observations referred to in this paper may be briefly summarized as follows: —

1. A healthy stomach does not require the aid of germs in the digestion of foods.

2. Sterile food is digested in the healthy stomach without the development of bacteria or other micro-organisms.

3. Neither free hydrochloric acid nor combined chlorine, even when present in excess, are certain means of sterilizing the gastric contents.

4. The gastric contents may be found sterile after a sterile test meal in cases in which free hydrochloric acid is entirely absent and the proportion of combined chlorine small.

5. Fruits, especially fresh fruits, and fruit juices when used in sufficient quantity, are capable of completely sterilizing the stomach.

AUTOAMPUTATION OF APPENDIX VERMIFORMIS: REPORT OF A CASE.

BY W. B. HOLDEN, M. D.,

Chicago, Ill.

MR. B., Wisconsin, student, aged twenty-three, single. Family history negative; personal habits good; no injury; no previous sickness; bowels more or less constipated.

November, 1899, he had pain in lower right abdominal region, but no vomiting, and was not very sick. Three weeks later he had severe pain in the same region, with vomiting, chill, and fever. He was confined to his bed for one month. Fomentations were used to relieve the pain. During the third week of this attack, about half a pint of pus was discharged from the rectum. The patient improved. He began his studies, and gained in weight.

April, 1900, he had the measles and also an attack of pain in the right iliac region. He was in bed two or three weeks, but did not fully regain his strength.

June, 1900, he suffered from pain in the right side, and from vomiting, chill, and fever. Soreness extended up the right side to the neck. Some swelling in the right iliac region was noticed. This time he was three weeks in bed. Recovery was incomplete.

September, 1900, he suffered an attack similar to the one in June, but there was no swelling.

Nov. 15, 1900, the attack was repeated. Ten days later the patient came to Chicago to the American Medical Missionary Hospital. His temperature was 100°; he was tired and quite prostrated. The right iliac region was bulging, tense, and tender, and the right leg drawn up.

Diagnosis. — Recurrent appendicitis, with periappendicular abscess.

The patient was prepared, given chloroform, and the abscess was opened, irrigated, and drained with gauze. This was done at noon, November 25. At 2 P. M. the patient's temperature was 100.8°; pulse, 84; respiration, 18. These remained about the same for three days. After this, until December 9, the temperature, pulse, and respiration were normal. Cold towel rubs with plenty of friction had been given three times a day. The patient improved; and the discharge from the abscess nearly ceased.

December 9, a second operation for complete removal of the appendix was undertaken. The first incision was sealed with collodion; the anesthetic used was chloroform. An incision four inches long was made through the right rectus muscle. The intestines were walled off by gauze napkins, adhesions were broken up, and the sinus followed to the appendix. This organ was found on the anterior surface of the cecum, bound down by firm adhesions, which were broken up with the finger. The appendix, which was discovered to be entirely free, was removed with the finger, and without a single suture or ligature.

A Mikulicz iodoform gauze drain was drawn through the first incision from the inside. The second incision was closed with figure-of-eight silk-worm gut sutures, and sealed with collodion.

December 10, the temperature was 100°, pulse 90, respiration 22.

December 11, the temperature was 101°, pulse 100–110, respiration 24 to 34. A troublesome cough from bronchitis caused the patient considerable pain.

December 12, the patient "tasted" chloroform. Iodoform intoxication was suspected, and the Mikulicz drain withdrawn. His temperature was 100°–102°, pulse 80–100, respiration 22, and he was coughing severely.

For the next seven days the temperature, pulse, respiration, and cough remained about the same, although a gradual improvement in appetite and general condition was noted.

December 21, the stitches in the second wound were removed. There had been primary union and no stitch abscess. At no time had the abdomen been tense or tender.

December 26, temperature, pulse, and respiration were normal, and remained so. About this time, wrist drop of the left hand appeared, thus adding color to the suspicion of iodoform intoxication. This paralysis nearly disappeared in two weeks.

January 15, the patient was discharged.

The amputation of the appendix probably occurred in December, 1899, when the abscess ruptured into the bowel, and

nature afterward treated it as a septic foreign body.

The interesting features of this case are: The number of attacks, six within a year; the position and freedom of the appendix; and the paralysis of the musculo-spiral nerve from the comparatively small amount of iodoform in the Mikulicz drain.

INTERMITTENT CHOREIFORM MOVEMENTS OF THE LEFT SIDE OF THE BODY FOLLOWING TRAUMA.

BY DUDLEY FULTON, M. D.,
Battle Creek (Mich.) Sanitarium.

C. S. H., aged thirty-five, engineer. His father had apoplexy, otherwise the family was healthy.

Personal History.— Healthy and temperate prior to present trouble. The patient made a good recovery from enteric fever last fall. April, 1900, the seventh and eighth ribs of the right side of the body, in the mammary line, were broken in a mine explosion. Weakness and pain in the back followed. He was in bed five weeks, after which increasing weakness, especially of the left knee, on walking was noticed. The left arm was also weaker than its fellow. There was dull pain in the occiput, and extreme tenderness of the spine. Immediately after trauma, there began irregular, intermittent twitching of the muscles of the left arm, leg, and body.

Examination.—Aug. 20, 1900, an examination of the patient revealed intermittent, painful choreiform movements of the left arm, muscles of left trunk and left leg, varying in intensity; frequency, from two to six per minute. Sensory irritations increased the spasmodic movements. There was tenderness from second to twelfth dorsal spine, more marked on the left side; area of hyperesthesia to heat, cold, and pain on left side of body posteriorly from second to twelfth dorsal, with a corresponding distribution around body, fading gradually at the parasternal line of the same side. The patient walked with a crutch and a cane. He wore a leather and an elastic body brace. The reflexes were lively; sleep and general health greatly disturbed.

Treatment.—Free elimination was encouraged by electric-light baths, flushing of the kidneys by abundance of water drinking, and by encouraging the activity of the bowels. The patient was kept at rest. The body braces were removed. Sedative full baths, temperature 98°–93° F., with a mild galvanic current, were given for an hour, daily. Neutral douches, without percussion, along the spine were also used. Sedative compresses to the spine and left side of the body were worn nightly. Later, when irritative symptoms had disappeared, mechanical and manual Swedish movements and galvanism were given to strengthen the weak muscles of the leg, arm, and trunk.

The choreiform movements ceased, all pain disappeared, the gait became normal, and the patient was discharged, cured, September 10.

The symptoms were probably due to nerve-root irritation of an inflammatory nature. Hysteria could be safely excluded.

Warts and Moles.—W. C. Abbott (*Alkaloidal Clinic*) suggests the use of ethylate of sodium for the removal of these unsightly little tumors. He applies it in the following manner: The growth to be treated should be walled in with a bit of wax or vaseline or mutton tallow, whatever of this nature is handy, and then a drop of the solution should be placed on its very tip. After two or three minutes, any remaining portion should be absorbed with a blotter. A caustic effect occurs which kills quite deeply, forming a dark scab which peels off and leaves the parts normal. If the growth is quite thick, one or two subsequent treatments may be required; but wait and see what does happen before applying another.—*Medical Standard.*

Phototherapy of Measles.—Chatiniere (*Arch. de Méd. des Enf.*, Vol. III, No. 9) treated seven cases of measles by means of red light (red curtains being hung at the windows), with excellent results. The temperature fell and the eruptions disappeared rapidly. The room should be moderately large, with two windows, and the bed so placed between them that the light falls directly upon the patient.—*Archives of Pediatrics.*

TRANSLATIONS AND ABSTRACTS.

[THE articles in this department are prepared expressly for this journal.]

The Treatment of Pneumonias of Infancy and Childhood.— I. A. Abt (*Medical Review*) states that the prophylaxis of pneumonia consists in the early treatment of every case of acute bronchitis and nasal catarrh which comes under observation. Such children should be confined to a warm and well-ventilated room. The nasal cavities should be cleansed several times daily with mild alkaline, antiseptic, or saline solution. Where there is laryngeal irritation and cough, the child should be put to bed, and given hot baths at a temperature of 95° to 100°. With pneumonia, the patient should be placed in bed, the temperature of the room kept even, at about 70°, with plenty of air space, and there should be a sufficient supply of fresh air. The patient's position should be frequently changed. The food should be carefully supervised. Milk is the main article to be used, and where there is difficulty of digestion, it may be peptonized. Water is to be given freely.

The writer has seen reduction of temperature follow the use of chest compresses, in which a piece of flannel or a towel is used to envelop the child, the flannel being dipped in water at from 65° to 70° F., and then covered with another flannel. This compress is changed every half hour or hour. If not sufficient to reduce temperature, cold or tepid sponges are employed. Sometimes rubbing at a temperature of 90° to 95° may be necessary. Warm baths are indicated with weak and debilitated children. Friction should always be maintained while the child is immersed, and the bath should last not longer than five minutes.

Emetics and expectorants have no place in the rational treatment of pneumonia. When the symptoms of bronchitis are prominent and the secretion is scanty, relief is sometimes obtained by steam inhalations. The cough in these cases is seldom so severe as to require the use of opium; the pain can usually be controlled by the use of the ice bag or cold compress. Counterirritation with mustard or turpentine is of value In protracted cases, general supporting treatment should be persisted in.— *Archives of Pediatrics, November, 1900.*

Treatment of Apparent Death of the New-Born.— Ribemont-Dessaignes (Thirteenth International Congress of Medicine) mentions the various methods of removing mucus, etc., from the air passages, and stimulating the peripheral nerves in order to start respiration. In cases in which wiping out the pharynx, rubbing, hot and cold baths, and similar measures fail, he prefers instrumental insufflation. For this purpose he has devised an intubation apparatus which he claims allows easy aspiration of mucus, and permits the entrance of only a limited quantity of air into the lungs, avoiding the danger of rupturing the walls of the air vesicles.

Champneys also favors this method. He opposes mouth-to-mouth insufflation, as exposing to rupture of the lungs, tuberculosis, and distension of the stomach. Of methods of manipulation, he considers those of Schultze and Sylvester as possessing merit and those of Marshall-Hall and Howard as useless in children.

The rules observed by Schultze are: (1) If the child is reddish-blue, he leaves the cord uncut, wipes out the mouth, and excites cutaneous reflexes. If there is no immediate response, he cuts the cord, and plunges the child for an instant into a cold and then a hot bath, repeating until the child cries vigorously. (2) If the child is pale and flaccid, he cuts the cord at once, wipes the pharynx, and performs artificial respiration by Sylvester's method or his own, with occasional use of the hot bath. If respiration remains superficial, the iced bath is also used.

At the Maternity Hospital at Bucharest, Draghiescu employs wiping out, aspiration of mucus by a tube, mouth-to-mouth insufflation, followed by artificial respiration by pressure upon the chest and the abdomen. Oxygen insufflation is sometimes of value.— *American Journal of Obstetrics and Diseases of Women and Children.*

Dyspeptic Asthma.— F. H. Murdoch (New York *Medical Journal*, Jan. 12, 1900) describes dyspeptic asthma as a state characterized by great shortness

of breath on slight exertion, the condition being not paroxysmal, but continuous. It occurs in patients suffering from gastrointestinal diseases, without any abnormal condition of the heart, lungs, or kidneys sufficient to account for it, and yields readily to treatment directed against the existing dyspepsia. He gives the clinical history of five patients, three of whom were suffering from achylia gastrica, one from hyperchlorhydria, while in one the gastric secretions were about normal, so that chronic dyspeptic asthma is not constantly associated with any one form of stomach trouble. None of the five patients, however, came complaining of dyspepsia. What they did come for was to obtain relief, if possible, from the distressing shortness of breath from which they suffered. It will also be seen that while an acute attack of dyspeptic asthma, coming on as it does after a meal, is relieved, for the time at least, only by emptying the stomach, the dyspnea attending the chronic form of the disease, being induced by exertion, however slight, is temporarily relieved only by rest. In one case the sudden attacks coming on at night were always the result of mental worry, and it is fair to suppose that the attacks of a similar character experienced by two other patients were also due to a disturbed condition of the nervous system. In both the acute and the chronic forms of the disease, permanent relief can come only from restoring the digestive organs to a healthy condition.— *Medical Record, Jan. 19, 1901.*

Bottini's Operation.—Freeman (Denver *Medical Times*, October, 1899) sums up the advantages of the operation as follows:—

1. There is no mutilation and no external wound, the manipulations being carried out through the urethra.

2. A general anesthetic, so dangerous in the old and debilitated, is not often necessary, local anesthesia being usually sufficient.

3. There is very little hemorrhage, the vessels being sealed by cauterization.

4. There is comparatively small danger of serious infection, and usually but moderate rise in temperature, the wounds being necessarily aseptic. The charred surfaces tend to prevent absorption until granulations appear.

5. In most instances, patients may sit up and even walk about in a few days, which is of great advantage in those who are old and feeble.

6. The effects may be almost immediate, more or less urine being voided within a few hours, where it was previously impossible to pass a drop.

7. But few relapses have been observed; in fact, improvement has a tendency to be progressive.

8. The operation may be repeated, if for any reason the attempt has been unsatisfactory.

9. The mortality is lower than with other effective measures.

10. Patients will avail themselves of this method of treatment when they will refuse to submit to castration, prostatectomy, etc.— *Buffalo Medical Journal, November, 1900.*

The Grape Cure.— *Gazeta Medica Lombarda* contains an account of the grape cure. This method of treatment is recommended by Dujardin-Beaumetz and others for cases of dyspepsia, especially when accompanied by constipation and in the gouty. It is also valuable in chronic diarrhea of dysenteric origin, and Tissot tells a story of a regiment of soldiers decimated by dysentery, which vanished in a marvelous manner on encamping among vineyards full of ripe grapes. Chronic cystitis is benefited by the alkaline carbonates developed by the vegetable acids of the fruit, but in such cases, care must be taken that the grapes are not sour. Cardiac affections are relieved by the laxative and diuretic action, while almost all patients are benefited by the fresh air, exercise, and early rising which the rules of the "cure" involve. Grapes grown on volcanic soil are said to have a more markedly stimulant and diuretic action than others. As to the amount, Dujardin-Beaumetz recommends patients to take as much as they possibly can without exciting disgust, while others advise a gradual increase to a daily maximum of four kilos. The duration of the cure is from one to three months.— *Medical Magazine.*

Treatment of Chronic Kidney Affections.— Groedel (*Deutsch. Med. Zeitung*) gives the results of his observations as to the action of the Nauheim baths on

cases of chronic nephritis, especially with reference to existing circulatory disturbances. He finds the bath contraindicated in (1) cases of chronic parenchymatous nephritis and those cases of secondary interstitial nephritis in which there is an increase of albumin or bloody urine; (2) cases of cirrhotic kidney, in which the circulatory disturbances are already advanced, dilated heart, pronounced dyspnea, and digestive troubles; (3) cases of cirrhotic kidney, associated with a high degree of arterial sclerosis; and (4) all cases having the least tendency to apoplexy, edema of the lungs, or Cheyne-Stokes breathing.

Outside of such cases, he maintains that the baths have a very favorable influence upon the heart, improving the circulation and the subjective symptoms. The stimulating action of the CO_2 causes a dilatation of the peripheral blood vessels; the diminution of blood pressure lightens the work of the heart, and thereby greatly contributes to their capacity for work. The diuresis observed, the writer thinks, comes rather from this improved heart action than from direct action upon the kidneys.— *Medical Standard, December, 1900.*

Physical Exercises in the Treatment of Pulmonary Tuberculosis.— Parker Murphy, in the Albany *Medical Annals* for November, 1900, says physical exercises play an important rôle in the treatment of pulmonary tuberculosis. They are contraindicated where there is temperature. One of the most important movements relates to the arm and the chest. He instructs patients to breathe deeply, even when they have fever. After the latter subsides, the patients are told to continue the deep respiratory movements, and with each inspiration to raise the arms slowly to a horizontal position and then over the head until the arms meet. As the arms are brought down, the patient exhales. This brings into action the supplementary muscles of the chest and shoulders, imitating the effect of altitude upon the respiration, expanding the chest, and bringing into action unused portions of the lungs, thus securing better ventilation. The movements may be varied, but the underlying principle is the same. Whatever movements are ordered, they must always be accompanied by a voluntary deepening of the inspiration. Such exercises are of quite as much importance in convalescence from pneumonia and pleuritis as in cases of pulmonary tuberculosis. In all the inflammatory maladies of the lungs there is a tendency to stasis and passive congestion. To correct this there is nothing better than deep inspiration.— *Medicine, January, 1901.*

A Single Requisition for Medicine. — *The Army and Navy Journal* gives the items of a single requisition of the medical officer at Manila for medical and surgical supplies: 7,500,000 grains of quinine, 20 tons of Epsom salts, 5,000 bottles of paregoric, 3,000 bottles of iodoform dressing, 8,000 bottles of collodium, 5,000 bottles of chloroform, 2,500 tins of ether, 16,000 bottles of bismuth, 7,000 bottles of alcohol, 10,000 quart bottles of whisky, 12,000 yards of plaster. There were also 600,000 compound cathartic pills, 1,000,000 tablets of strychnin, 1,600,000 tablets of sodium salicylate, 625,000 tablets of salol. Of surgical dressings there were 50,000 yards of plain gauze, 5,000 yards of unbleached muslin, 50,000 sterilized bandages, 4,000 pounds of absorbent cotton, and 96,000 roller bandages.— *Practical Medicine.*

Perforation of the Pancreas and Duodenum by a Tapeworm.— Stieda (*Centralbl. f. Bakt.*, Oct. 15, 1900) reports a post-mortem examination on a woman aged sixty-eight, who died from an ulcerating carcinoma of the pylorus encroaching on the duodenum. In the duodenum a tapeworm (*tænia saginata*) was found; it had reached the lumen by perforating the intestinal wall. The head of the worm was found, by cutting serial sections, to be imbedded in the pancreas. Inflammatory reaction around the worm pointed to the perforation having occurred during life. Stieda has not found a similar case recorded.— *British Medical Journal, Jan. 12, 1901.*

Treatment of Ulceration with Hot Air.— K. Ullman, who has previously proclaimed the rapid and beneficial results of local hyperemia from the application of hot air in the treatment of

chronic and infectious ulcerative processes, in the *Wiener klin. Wochenschrift*, December 27 and January 3, reports and illustrates a number of cases cured by his apparatus, and advocates the method for venereal ulcers and all ulcerative processes, particularly of the genital tract. He had noted repeatedly a favorable influence on the general health and remote morbid foci, and describes, among others, a case of arrest and cure of a serpiginous venereal infectious process.— *Journal of the American Medical Association.*

Alcohol and Insanity.— Strong drink is bad for the liver, for the kidneys, for the heart, in fact, for the whole man, but it is especially bad for the nervous system; and this injurious effect of alcohol upon the nervous system affects not only the drinker, but his children after him.

The report of the London County Council shows that drink is a more prolific cause of insanity than even hereditary taint.

During 1899, 21,000 lunatics were cared for, and of these, 3,500 were made crazy by strong drink.

Alcohol may be food, but it is very poor nourishment for nerve cells.

The man who takes a drink to steady his nerves is like the father who would stick his child's head in a tub of water to stop its cries,— the measure being perhaps effective for the purpose, but bad for the thing affected.— *Charlotte Medical Journal, November, 1900.*

Experimental Research on Symptomatic Anthrax.— E. Leclainche and H. Vallee (*Journal of Laryngology, Rhinology, and Otology*, October) by research have established the fact that the bacterium of symptomatic anthrax is capable of producing an active toxin. Spores free from the toxin are unable to germinate and produce infection when introduced into an organism. The resistance to infection is connected with phagocytosis, and everything that tends to inhibit it favors infection. Vaccination of cattle with pure cultures heated at 70° for two hours, supplemented by inoculation of a pure, nonheated culture, enables the animals to bear without reaction extremely large amounts of virulent juices. The pure vaccin can be prepared in the form of a powder. An effective immunizing and preventive serum can be produced, but its effect is transient.

The Salaried Physician.— As many know, the Chinese physician receives a salary from his patients as long as they are well, but as soon as they get ill, his pay stops. Some American families, not disdaining to learn something from the other side of the world, have partially adopted the same plan; that is, they pay the salary whether they are sick or well; and it is, of course, to the interest of the doctor to keep them well as far as he can, to save himself the trouble of attending them. When the Chinese method, or the American modification of it, comes into general practice, it will be to the interest of the physician who has charge of a family to study each member of it physically, mentally, spiritually; to prescribe for them correct environment, proper diet, and healthful habits; and to labor with the view of inducing them to keep in touch with all these.

Prevention of Hemorrhoids. — Matthews (*Medical Age*) calls attention to the fact that cold water, when properly applied, is the best agent for the preventive and palliative treatment of internal hemorrhoids. Hot water, when injected into the rectum, has a relaxing effect, increasing the venous congestion, thereby aggravating the condition and allowing the hemorrhoids to protrude. Cold has the opposite effect, in that it contracts the vessels and combats the local congestion.

Intestinal Antisepsis in Exophthalmic Goiter.— Mary Putnam Jacobi (*Medical News*) describes a case occurring in a woman twenty-two years of age who presented the characteristic symptoms of the disease. Various nerve and vascular tonics had been employed without benefit. This form of medication was finally abandoned, and intestinal antiseptics and daily flushings of the colon were employed. Under this form of treatment the diarrhea and other symptoms gradually disappeared.

Tea and Coffee as a Cause of Insomnia.— Sir James Sawyer, Birmingham, England, lecturing recently on insomnia, said: "The effects of the consumption of tea and coffee in causing sleeplessness are well known. This effect is so obvious that patients usually remedy it for themselves. As is well known, tea in the form of an infusion or of a decoction is generally used in civilized countries as the daily beverage of the people. Tea leaves contain an alkaloid which has been called thein, and coffee seeds contain caffein, and thein and caffein have been shown to be identical, and both these leaves and these seeds contain only principles. With regard to tea, what may be called its "physical action" appears to depend upon the joint action of its thein and of the volatile substance which tea-leaves contain. What is called "green tea" is produced by drying the fresh leaves on a heated iron plate until they become shriveled. Black tea is manufactured by placing the leaves in heaps, and allowing them so to lie while they undergo a kind of fermentation, after which they are dried. Green tea and black tea are powerful cerebral stimulants, exciting the mental faculties and the cerebral circulation, and tending to prevent sleep. Coffee, too, is a cerebral stimulant and antisoporific. It is sometimes used in need for these properties to counteract the effects of opium and its derivatives, and of other narcotic poisons.— *Medical Record.*

Oral Sepsis as a Cause of "Septic Gastritis," "Toxic Neuritis," and Other Septic Conditions.— William Hunter (*Practitioner*, December, 1900) says that the condition of the mouth associated with the presence of decayed teeth and rotten fangs is a condition of profound sepsis, differing from ordinary sepsis in that all the pus organisms are continually being swallowed. It is also a sepsis connected with diseased bone. The gastric juice has fortunately a great capacity for killing organisms, but this capacity is not complete in the intervals between food. Cases of gastric catarrh become septic catarrh; septic absorption from teeth and gums must be considerable, and there is also danger of infecting the tonsils, with consequent danger of tonsilitic, pharyngeal, and Eustachian-tube infection. The treatment should consist in removal of diseased stumps and roots, or if that is impossible, in the direct application to each diseased tooth of carbolic acid, one in twenty or one in forty, rubbed in by means of a camel's-hair brush or a piece of cotton-wool.— *Medical Record, Feb. 9, 1901.*

Cancer of the Stomach.— The following rules are suggested upon which to base a positive diagnosis of cancer of the stomach: —

1. If particles of tumor are found (in the wash water or in the tube) which under the microscope reveal the characteristic picture of a malignant growth.
2. The presence of a more or less large tumor with an uneven surface, belonging to the stomach and associated with dyspeptic symptoms.
3. The presence of a tumor associated with frequent hematemesis.
4. Constant pains, frequent vomiting, ischochymia, emaciation, all these symptoms being quite permanent and not extending over too long a period of time (six months to a year).
5. Tumor and ischochymia.
6. Emaciation, ischochymia, presence of lactic acid.
7. Constant anorexia and pains, not yielding to treatment, accompanied by frequent small hemorrhages of coffee-ground color. — *M. Einhorn, in New York Medical Journal.*

Where the Centenarians Reside. — More people over one hundred years old are found in mild climates than in the higher latitudes. According to the last census of the German Empire, of a population of 555,000,000, only 78 have passed the hundredth year. France, with a population of 40,000,000, has 213 centenarians. In England there are 146; in Ireland, 578; and in Scotland, 46. Sweden has 10, and Norway, 23; Belgium, 5; Denmark, 2; Switzerland, none. Spain, with a population of 18,000,000, has 401 persons over one hundred years of age. Of the 2,250,000 inhabitants of Servia, 575 have passed the century mark. It is said that the oldest person living is Bruno Cotrim, born in Africa, and now living in Rio de Janeiro. He is 150 years old. A coachman in Moscow has lived for 140 years.— *Indian Medical Record.*

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

The Action of Quinine on the Plasmodium Malariæ.—Monaco and Panachi (*Arch. Italien de Biol.*, XXXII) have recently made a very interesting study of the effect of quinine on the plasmodium malariæ. Their method of procedure was the observing of life-changes of the parasite in a drop of malarial blood and the influence of the isotonic salt solution, and the effect of various quinine solutions in the different life-periods of the plasmodium. Their studies embraced the tertiary and quartan types. The life of the malarial parasite, according to their observations, is divided into four stages: (1) young forms; (2) adults (occupying nearly two fifths of the blood corpuscle); (3) the ripe forms (occupying the whole corpuscle); (4) the sporulating forms. A drop of 1:1,500 quinine bisulphate solution (approximately corresponding to a dose of forty-five grains for a man of average weight) was brought in contact with blood containing the youngest forms, producing a contraction of the parasite, with trembling of the pseudopods and a consequent centering of the pigment granules. These pigment granules after a short time return to the periphery, and the parasite expands to its former dimensions, and behaves as before the action of the quinine. The same solution produces on the adult plasmodium a contraction, a central collection of the pigment, a retraction of the pseudopods, which seem to produce such an increase of internal dimensions as to shoot it out of the corpuscles with great suddenness. Like changes were noticed in the ripe forms, except that the parasite did not pass out of the corpuscle, but became very shrunken, the granules escaping into the blood-serum. Smaller doses of quinine seemed to act as a stimulant to the parasite, and quite large doses seemed to paralyze it, but did not cause it to pass out of the corpuscle. Their conclusions are that quinine operates for good by casting the parasite out of its favorable host (the corpuscle) into the serum, where its growth is inhibited. Therefore they conclude that the administration of too large doses of quinine is impracticable when it presents this favorable outcome. It was observed that the plasmodia taken from the blood at various stages of malaria were most susceptible to the action of quinine when obtained just before the height of the fever, and from that time until the middle of the apyretic interval the parasites became more and more resistant. It would thus seem that the empirical method of giving quinine just before the expected attack, is founded upon correct scientific principles.—*Medical Age, Jan. 10, 1901.*

A Comparative Study of the Biological Characters and Pathogenesis of Bacillus X (Sternberg), Bacillus Icteroides (Sanarelli), and the Hog-Cholera Bacillus (Salmon and Smith).—W. Reed and J. Carroll (*Journal of Experimental Medicine*, December, 1900) conclude as follows:—

1. Bacillus X (Sternberg) belongs to the colon group.

2. Bacillus icteroides (Sanarelli) is a member of the hog-cholera group.

3. The various channels of infection, the duration of the disease, and the gross and microscopical lesions in mice, guinea pigs, and rabbits are the same for bacillus icteroides and the hog-cholera bacillus.

4. The clinical symptoms and the lesions observed in dogs inoculated intravenously with bacillus icteroides are reproduced in these animals by infection with the hog-cholera bacillus.

5. Bacillus icteroides, when fed to the domestic pig, causes fatal infection, accompanied by diphtheritic, necrotic, and ulcerative lesions in the digestive tract, such as are seen in hogs when infected with the hog-cholera bacillus.

6. This disease may be acquired by exposing swine in pens already infected with bacillus icteroides, or by feeding them the viscera of infected pigs.

7. Guinea pigs may be immunized with sterilized cultures of bacillus icteroides from a fatal dose of the hog-cholera bacillus, and *vice versa.*

8. Rabbits may be rendered immune by gradually increasing doses of a living culture of bacillus icteroides of weak virulence from a fatal dose of a virulent culture of the hog-cholera bacillus.

9. The sera of animals immunized with bacillus icteroides and with the

hog cholera bacillus, respectively, show a marked reciprocal agglutinative reaction.

10. While the blood of yellow fever practically does not exercise an agglutinative reaction upon bacillus icteroides, the blood of hog cholera agglutinates this bacillus in a much more marked degree, thus pointing, the writers think, to the closer etiological relationship of this bacillus to hog cholera than to yellow fever.

Bacteriology of Scarlet Fever.— Baginsky and Sommerfeld (*Berl. klin. Woch.*, 1900, No. 28) give the results of researches on this subject. In all cases of scarlatinal angina, streptococci are to be found, sometimes in pure culture, sometimes mixed with other cocci, but always greatly preponderating. In all the forty-two cases investigated of fatal scarlatina in children, a streptococcus was found in all the organs, the blood, and the bone marrow. This resembled the ordinary streptococcus morphologically and in biological and culture characteristics. With the methods of culture at present available the different streptococci can not be differentiated. This streptococcus is virulent, and its virulence can be increased by passage through animals, but its specific character can not be studied by present culture methods. Its constant presence is significant of a specific rôle, and the symptoms of scarlet fever are explainable on the theory of the propagation of the organism in the tissues and the production of toxin therein.— *British Medical Journal, Jan. 12, 1901.*

Recent Advances in the Bacterial Treatment of Sewage.— D. H. Bergey (*University Medical Magazine*, December, 1900) describes various systems in use, such as the septic tank, the contact beds, and the coal filter.

Professor Claves gives the following advantages of bacterial over chemical treatment: It requires no chemicals, produces no offensive sludge, but only an odorless deposit of sand and vegetable tissue, removes the whole of the suspended matter, and effects the removal of 51.3 per cent of the dissolved oxidizable and putrescible matter. The resultant liquid is entirely free from objectionable smell, does not become foul when kept, and maintains the life of the fish. But as these methods fail to destroy such organisms as the bacillus coli communis, it is safe to believe that they are also incapable of destroying the typhoid bacillus when present. When suitable land is at hand, the effluent of the system of contact beds should be applied to it. Otherwise, sand filtration, or electrolysis, or chemical treatment may be used to render the effluent harmless.— *Medical Record.*

Localizations of the Bacillus of Leprosy in the Different Organs.— E. Jeanselme (*La Presse Médicale*), in his interesting paper on this subject, gives the following results of blood examination. In one patient, whose blood was examined eight times in eleven days, during the febrile stage, the red corpuscles varied from 3,880,000 to 4,120,000. Hemoglobin varied from 9.75 to 10.25. White corpuscles varied from 11,600 to 6,000. A feeble patient, an adult, gave the following count: Red corpuscles, 3,240,000; hemoglobin, 10.25; white corpuscles, 6,000. A girl aged fourteen, who had been afflicted with this disease since the age of eight, presented: Red corpuscles, 4,400,000; white corpuscles, 4,200. An adult man (four examinations) presented: Red corpuscles, 4,760,000 to 4,880,000; hemoglobin, 9.50 to 10; white corpuscles, 4,800 to 10,400. An adult woman (one examination) presented: Red corpuscles, 3,720,000; hemoglobin, 9.25; white corpuscles, 4,000.— *Medical Record, Jan. 12, 1901.*

Elimination of Bacteria by the Liver and the Kidneys.— Metin (*Ann. de l' Inst. Past.*, June 25, 1900) has conducted experiments to decide whether bacteria are eliminated in the bile and the urine, the opinions on this question being contradictory. Rabbits were intravenously injected with cultures of B. subtilis, staphylococcus aureus, B. anthracis, and other organisms, and guinea pigs were inoculated subcutaneously with the same. Great care had to be taken to obtain the bile and the urine unmixed with blood. These secretions were taken at periods from a quarter of an hour to twenty-six hours after inoculation, and in all cases where they were free from blood,

they were found sterile. B. anthracis causes hematuria and lesions in the kidneys; urine, taken twenty-four hours after inoculation, gives cultures of the organisms, but the bile is sterile. The kidneys and liver must therefore be considered impermeable to bacteria, unless the latter produces an admixture of blood with the secretion.— *Medical Age.*

The Bacteriology of the Influenza Bacillus.— Dr. August Jerome Lartigau says that the influenza bacillus, discovered by Pfeiffer in 1892, appears as an extremely small, slender, nonmotile bacillus, the length of which scarcely exceeds its breadth by two or three times. The bacilli may be stained by any of the basic aniline dyes, which they take up rather feebly and irregularly; the poles are usually more deeply colored than the middle parts, often giving the appearance of diplococci. Outside the body, it is very susceptible to injurious influences, and from many observations it has been generally assumed that the extracorporeal existence of the influenza bacillus must be very short, and that infection probably takes place by means of the freshly contaminated secretions. With certain limits an early diagnosis may often be made by a mere microscopical examination without resorting to cultures. When other bacteria are present, the diagnosis becomes more difficult, and cultures are usually then required. Pure cultures may best be obtained on the surface of solid media previously smeared with a small amount of human or animal blood. — *Medical News, Dec. 15, 1900.*

Bacterium Coli in Constipation.— Roos (*Münch. Med. Woch.*, Oct. 23, 1900), reviewing the classic treatment of constipation, adverts to the possible influence of intestinal bacteria upon peristalsis by reason as well of their functional chemical activity as of their purely mechanical presence, and relates a series of successful experiments conducted upon himself and others, tending to demonstrate how the ingestion of pure cultures of bacterium coli prevents intestinal peristalsis. From other tests conducted with the products of bacterial activity, he concludes that the noticeable increase in peristalsis is really traceable to functional bacterial activity rather than to the presence of secondary bacterial products.— *Medical Age, Jan. 10, 1901.*

Experiments with Bacillus Typhosus.— Prof. William Royal Stokes, city bacteriologist, and Professor of Pathology at the University of Maryland, has lately completed a long series of experiments with typhoid bacilli, which were fed by him in large quantities and continuously to dogs, cats, pigs, calves, white rats, guinea pigs, and rabbits. The animals remained perfectly healthy. Cultures were also taken from the animals every day, but no colonies of typhoid bacilli were ever obtained from them. The conclusion reached by Dr. Stokes is that the typhoid bacillus can not maintain its struggles for existence in the intestines of any of the animals experimented upon. — *Philadelphia Medical Journal.*

Microbes in the Beard.— Dr. Schoull, of Tunis, has discovered that the beard is simply a "happy hunting ground" of bacilli. He has proved it upon the guinea pig, which he has inoculated with the "material obtained from beards and mustaches," with results distressing to the guinea pig, and alarming to those who had been in more or less contact with the beards and mustaches aforesaid. This is a very disagreeable discovery, and may seriously affect the popularity of a form of facial adornment which has hitherto been regarded as open to no other objection than that it is a nuisance to its wearer when in the act of taking soup. But what are a few shreds of vermicelli compared with a whole army of able-bodied bacilli lying in ambush for their victims, and, what is more, ready to make a victim of anybody who happens to come within their range? — *Sanitarian.*

Influence of Liquid Air upon Bacteria.— Dr. J. Moyer (*Centralblatt fur Bakteriologie, Parasitenkunde, Infektionskrankheiten*, Nov. 17, 1900) has experimented upon the anthrax spores and the staphylococcus pyogenes aureus with liquid air by spraying the liquid air upon the cultures; by placing it directly upon the cultures; and by placing the tubes in liquid air. In no instance was there death of the bacteria or a loss of their properties.

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DIET IN GASTRIC DILATATION.

ALBU has recently brought forward facts which are of immense practical value in dealing with cases of gastric dilatation, the extreme frequency of which has of late come to be recognized in this country as well as in France, where, through the labors of Glenard, Trasteur, Dujardin-Beaumetz, and others, the grave significance and frequent occurrence of this condition have long been understood. Albu advises a fluid or softened diet instead of the dry diet which has been recommended by some observers, insisting that the disturbance of the physiological functions of the stomach is a matter of much more importance than the mere anatomical condition. He prohibits the use of beef, pork, and all fats, with the possible exception of a small quantity of butter. The reason for the prohibition of beef, pork, and fats is evident. The weakened stomach is slow, the digestive ferments are present in deficient quantity, and the amount of hydrochloric acid produced is usually very greatly diminished, extreme hypopepsia or apepsia being the prevalent condition accompanying dilatation. This the writer has abundantly shown in a careful study of over ten thousand cases of gastric disorder, in which there has been careful examination of the gastric fluid, in connection with a careful physical examination of the stomach.

Albu afterward recommends the following diet: —

8 A. M. — A cup of milk and two rolls.

9 A. M. — A cup of cream.

10 A. M. — Two soft eggs.

11 A. M. — A cup of cocoa with milk.

12 M. — A saucer of cereal food (oatmeal or cracked wheat).

1 P. M. — A quarter of a pound of sweetbreads, three tablespoonfuls of spinach.

3 P. M. — A cup of milk.

4 P. M. — A cup of chocolate and zwieback.

5 P. M. — A cup of cream.

6 P. M. — A saucer of oatmeal soup with egg, "plasmon," or four tablespoonfuls of minced meat.

7 P. M. — Soup with egg and a roll.

8 P. M. — A cup of milk.

9 P. M. — A cup of milk.

Before presenting this bill of fare, Albu remarks, "The meals should follow one another closely, just sufficient time being allowed to prevent interference of the meal with the preceding." How this is done, however, when the patient is fed thirteen times in thirteen hours, is not clearly explained. The learned doctor very wisely follows his diet prescription with the direction that lavage of the stomach should be practiced night and morning. After each of these washings a fluid meal, consisting of condensed milk with "plasmon" and various other things, is administered through the stomach tube. So really the patient receives fifteen meals per diem, and yet no meal must be allowed to interfere with the preceding! It is evident that the stomach must be kept active, and not once allowed to become empty during the entire period between morning and night. A stomach treated in such an extraordinary manner ought to be washed at least twice a day.

The dietetic method suggested by Dujardin-Beaumetz, Bouchard, and other French authorities seems to the writer to be very much more sensible than that of the German authority above referred to. Only two meals a day are allowed to

patients with dilated stomachs, and these meals are placed from seven to nine hours apart. In some instances an intermediate light lunch of some easily digested food is allowed. The writer has pursued this method for many years with excellent success, and believes it to be in every way preferable to the German method of feeding every hour. There are few stomachs which will not rebel at such treatment. The majority of patients find themselves quite unable to take food at such frequent intervals. Milk, as Glenard has shown, is an exceedingly questionable article for use in cases of gastric dilatation. If taken at all, it must be in the form of kumyss or buttermilk, as raw milk forms hard curds in the stomach, which are very slowly dissolved, and often undergo putrefactive changes, and when they fail to digest, they can not be easily washed out through the tube,—a matter of much importance in cases of dilatation resulting from pyloric stenosis.

THE PLAGUE IN AMERICA.

THAT the bubonic plague, or the disease commonly known as "black death," which once devastated London, and destroyed so many millions of lives during the Middle Ages, has actually reached America, and has obtained a foothold here, is now an unquestioned fact. Dr. Blunt, Health Officer of Texas, recently reported as follows:—

"The plague was first officially reported from Bombay in April, 1898, since which time it has made rapid progress. It has reached both coasts of South America, and has appeared in Europe at Oporto, Hamburg, Glasgow, and London. It reached San Francisco last March. This has made it necessary to maintain an interstate quarantine against that city from May 29 of the present year [1900] until now, and I regret to state that the disease continues to spread there."

Dr. J. J. Kinyoun, quarantine officer at San Francisco, made the following official report:—

"I would state that it is my belief that the area of infection is gradually growing wider, so that now there are only three blocks of the Chinese quarter proper in which there has not occurred since March last a case of plague. The conditions which will obtain in the next six months will be, in my opinion, conducive to a further spread of the disease. I believe other cases occurring in San Francisco are being reported under another name."

There has been much discussion in the country respecting the reality of the existence of bubonic plague in San Francisco, which has grown out of the divided state of mind of the local board of health of that city. The Health Officer of Texas visited San Francisco for the purpose of making a personal investigation. From his report we give the following quotation:—

"Twenty-two cases have been officially reported by the City Board of Health of San Francisco, the first case occurring March 6, 1900. With the exception of four cases, they have all been found after death. All but two occurred in the Chinese quarter, and all save three were Chinese. Many of them had been treated during their illness, and death certificates were given by the attending physician, for other diseases.

"Diagnosis was made by post-mortem and bacteriological methods,—the most exact methods known to medical science. This diagnosis has been concurred in by every competent authority who has made an examination, among whom I will mention Doctors J. J. Kinyoun, Rosenau, Geddings, Kerr, Lumsden, Gassaway, and Agnes Walker, of the Marine Hospital Service; Dr. Kellogg, pathologist of the Board of Health of San Francisco; Professors Montgomery, Kerr, Ryfkogel, and Taylor, of the University."

COLLAPSE OF A RAW-MEAT SANATORIUM.

A FEW months ago there was opened in Belgium a sanatorium for the special purpose of treating tuberculous patients according to Richet's method, which consists chiefly in feeding the patient upon a diet of raw meat. Three months' experience was sufficient to convince those in charge of the hospital that "there was no efficacy whatever in the method." The experiment has accordingly been abandoned, and the institution has been closed.

The astonishing thing is that medical men can be found who are so devoid of physiological knowledge and scientific training, not to say ordinary good sense or common gumption, as to be willing to risk their reputation in connection with an effort of such a sort. It has long been asserted by physiologists that human beings can not live on an exclusive meat diet without seriously imperiling the health. Even dogs, which are supposed to be carnivorous animals, become sick if fed exclusively upon meat. If a dog is wanted for hunting purposes or to perform in an animal show, meat is carefully excluded from his dietary, it being well recognized that a nonflesh dietary gives a dog better wind, greater endurance, and renders him more intelligent and tractable than does a flesh dietary. Diabetics fed upon a meat diet become comatose, and die of autointoxication, a fact which the medical practitioners of France were the first to recognize, but which has now become known to the whole medical world. That a meat diet increases the frequency of the fits or paroxysms in epilepsy is so well known that for more than twenty years, leading neurologists have habitually recommended the discarding of a flesh dietary in this disease. All physicians prohibit meat in fevers, and the late Dr. Austin Flint found that fever patients do even better without beef tea. The substitution of milk as a food for animal broths, beef tea,—a mere stimulant, or, as an eminent French physician remarked, "a veritable solution of poisons,"— was a great advance in the dietetics of fevers.

Dr. Salisbury introduced the meat-diet method in the treatment of consumption, Bright's disease, and dyspepsia; in fact, he seemed to recommend it as a panacea, and his pupil, Dr. Cutter, even proposed to cure fibroid tumors of the uterus by this absurd method. Dr. Salisbury managed to keep his patients alive by drenching them with water. Many patients have gotten better under this régime, not because meat was good for them, but because a simple meat dietary was better than the rubbish they had been eating before, which consisted of meat with everything else besides. But a simple, natural dietary is better yet, and this fact has been proved in so many thousands of cases that it can not longer be questioned. The patient suffering from tuberculosis needs fat and blood. He can get these better by a nonflesh dietary than by the use of flesh, and without running the risk of increasing his fever, and adding new morbid conditions to those from which he is already suffering.

THE HOT VAGINAL DOUCHE.

THE use of the hot water vaginal douche was the subject of discussion at a recent meeting of the New York County Medical Association. Various opinions were expressed concerning the value of this hydriatic procedure. One speaker maintained that at least three gallons of water should be employed, and the application should be made twice daily. Others recommended a smaller quantity of water, suggesting that duration only is the essential, not the quantity of water. A single surgeon maintained that there is little use for this procedure at the present time on account of the important ad-

vances which have been made in surgery since this procedure was first suggested by Dr. Thomas Emmett, in 1862. The temperature recommended was from 107° to 120°.

The use of vaginal irrigation at lower temperatures is an important point which seems not to have been touched upon in this discussion. In many gynecological cases the use of hot water is not advisable. Max Runge showed long ago that the prolonged use of water at 115° to 120°, results in paralysis of the blood vessels, producing a passive congestion, which continues for a considerable length of time after the application ceases. The lesson to be drawn from these experiments is that hot applications should not be too greatly prolonged. Greater benefit will probably be derived from the employment of an application of water as hot as can be borne during eight to twelve minutes than from a more prolonged application. The effect of the hot application is to dilate the blood vessels of the pelvis, and, in fact, to relax the whole portal circulation, thus diverting into this region of the body a considerable amount of blood. The general heating of the body also diverts a considerable amount of blood into the skin. The natural result of this extensive withdrawal of blood from the general circulation may be temporarily inconvenient, or even injurious in cases of anemic patients, especially those who have a tendency to cerebral anemia and cardiac weakness. This effect may be antagonized by applying a cold bag over the heart during the treatment, and by the application of heat to the back of the neck to dilate the vertebral arteries. In cases in which chronic anemia and relaxation and lack of tone in the tissues are prominent symptoms, water at a lower temperature should be employed. Irrigation at 80°, even at 75°, often produces good results in cases when hot applications cause unpleasant and undesirable effects.

DEGENERATION OF THE ANGLO-SAXON RACE.

THAT the Anglo-Saxon race is degenerating is too patent a fact to be denied any longer. Intelligent physicians are beginning to discuss the causes of this decadence. Dr. James Russell, of Hamilton, Ontario, recently read before the American Psychological Association a paper in which he maintained that the race is degenerating. We quote as follows: —

"Nowadays, men have no time for reading except for recreation or business demands. They scan the morning newspaper for the war news, the stock exchange reports, or the latest horse race or prize fight. The gambling spirit is dominant everywhere, and is not confined to one sex. There is no time for deep reading or profound thinking. The mad struggle is after wealth. Literary barrenness is the consequence, and the tendency everywhere is to superficial thinking, with a little knowledge of everything. There are no great living poets, philosophers, or divines to whom the masses are looking for guidance. They are not forthcoming because there is no demand for them. The mind of the age is focused on one great, paramount idea — the acquisition of wealth. The human brain is a composite organ, and susceptible of wonderful expansion and development, but like everything human, it has its limitations. Whether or not it can stand the enormous strain of the present rate of activity, and continue to project itself with unabated vigor into the future, is the great problem now before us for discussion. If we are to be guided by the history of the past, we must answer in the negative."

The Sympathetic Origin of Asthma. — In a discussion respecting the origin of asthma and the numerous theories which have been presented to account for the peculiar disturbances in the respiratory rhythm occurring in this disease, a recent

writer calls attention to an observation which long ago convinced him that the characteristic feature of this disease is more or less directly connected with the sympathetic nervous system, at least in cases of the so-called "nervous type" of asthma. Having for many years made a careful study of the so-called Leukart's points, the ganglia of the sympathetic located in the region of the umbilicus, attention was incidentally called to the fact that pressure upon these points may bring on immediately a paroxysm of asthmatic breathing in patients subject to asthmatic attacks. This observation was made in a number of patients, and has frequently been repeated. The pressure should be made about two inches on either side of the umbilicus, the fingers being carried well back until the posterior wall of the abdominal cavity can be distinctly felt. The sensitive areas are often no more than one-half inch in diameter, so that they may easily be overlooked unless the examination is carefully made.

Dyspepsia from Umbilical Hernia. — Zaphé, of Paris, read at the late International Medical Congress an interesting paper in which he demonstrated the constant association of umbilical hernia and enteroptosis. He attributed enteroptosis to abnormal tension upon the stomach resulting from an omental bridle, formed by adhesions of the greater omentum to the umbilical ring, both the colon and the stomach being pulled out of place, the movements of the stomach interfered with, and the colon depressed in the center. These conditions give rise to what Zaphé terms a "hernial dyspepsia." The cure is effected either by reducing the hernia and fitting a plug into the opening by means of a suitably shaped pad held in place by a bandage, or by a surgical operation for the radical cure of the hernia. These observations attach a new importance to umbilical hernia, since, according to Zaphé, symptoms of dyspepsia due to this condition rapidly disappear when the hernia is relieved either by a proper truss or by surgical measures.

Rheumatic Gout a Germ Disease. — Dr. A. O. J. Kelly, in a paper published in the *Journal of the American Medical Association* for Dec. 20, 1900, makes a pretty clear case in favor of the bacterial origin of arthritis deformans. Schüller demonstrated in the diseased joints a bacillus which when inoculated into the joints of animals, produced lesions similar to those observed in human joints, the subject of this disease. Bacteria have also been found by von Dungern and Schneider, Wohlman and Blaxhall, and others; von Dungern and Schneider found a diplococcus in the gall bladder which produced arthritis deformans in rabbits. From this they conclude that the gall bladder is the headquarters for the infection which extends to the joints. Kelly holds that the local seat of the bacillus is the synovial membrane. Many of the lesions accompanying this disorder are without doubt due to toxins produced by the microbe which constitutes the specific cause of the disease.

Brain Failure. — A French statistician has made a careful study of insanity and brain failure in relation to occupation. He found that military men most frequently become lunatics, 100,000 men of the army and navy furnishing nearly 200 insane. Scientists came next in order, then lawyers and doctors, clergymen, scholars, civil servants, domestics, common laborers, mechanics, and commercial men. French merchants seem to be the most level-headed portion of the whole population, becoming insane only one fifth as frequently as do fighting men, and about one fourth as often as physicians. In this country, in which the social and commercial conditions differ widely from those of France, it is more than likely

that the business men will be found at the other end of the list.

The Use of the Enema in Insanity. — Dr. M. Craig, in a paper recently contributed to the *British Medical Journal* (Sept. 22, 1900), states that the blood pressure is invariably low in acute mania, while high in melancholia. The lower pressure in mania is responsible for the restlessness which is a constant symptom in this condition. This restlessness Dr. Craig has found to be relieved by the employment of an enema of eight to ten ounces of water. The patient's condition steadily improves when the enema is retained. This is a new and very important indication for this simple hydriatic procedure. The warm or neutral bath ought to be as useful in relieving the high pressure of melancholia as is the enema in relieving the low pressure of mania. The temperature of the bath should be 94° to 96°, the duration from thirty to sixty minutes.

Bacteriology and Gall Stones. — Dr. F. G. Shattuck holds that the colon bacillus and the typhoid bacillus are the most common bacilli active in the formation of gall stones.

REVIEWS.

A TEXT-BOOK OF THE PRACTICE OF MEDICINE. — By James M. Anders, M. D., Ph. D., LL. D., Professor of the Practice of Medicine and of Clinical Medicine in the Medico-Chirurgical College, Philadelphia; attending physician to the Medico-Chirurgical and Samaritan Hospitals, Philadelphia, etc. Illustrated. Third edition, revised. $1. W. B. Saunders, 925 Walnut St., Philadelphia.

This work is a lucid and comprehensive treatise on rational medicine, in which the subject is well brought up to the date of publication. The author has evidently kept fully abreast of modern progress in pathology, as well as clinical medicine, and has embodied in his work the best thought of the best men. He has made quite a wide departure from older treatises in that he has left out a multitude of old-time remedies which the light of modern research has shown to be not only insufficient, but utterly irrational, and has, at least for the most part, confined his recommendations under the head of treatment of therapeutics to such remedies as have a rational basis, and have been shown by experience to be of rational, definite value. The ethnology and hygiene of preventable maladies are well discussed, and considerable attention is given to such physiological measures as hydrotherapy, electrotherapy, diet, and climatic influences, although more space might with advantage have been given to these branches of therapeutics.

After a careful examination of the work from beginning to end, we feel justified in pronouncing it the best English work for medical students and busy practitioners which has yet appeared in print.

The publishers have given the work a fine setting. The type is clear, the paper of good quality, and the work is fairly well illustrated with useful and well-printed cuts. The diagrams of the nervous system and the colored plates illustrating normal and pathological blood are especially excellent. The work ought to be in the hands of every practitioner who expects to keep himself abreast with the progress of medical science.

STUDENTS' EDITION: A PRACTICAL TREATISE OF MATERIA MEDICA AND THERAPEUTICS, with special reference to the clinical application of drugs. — By John V. Shoemaker, M. D., LL. D., Professor of Materia Medica, Pharmacology, Therapeutics, and Clinical Medicine, and Clinical Professor of Diseases of the Skin in the Medico-Chirurgical College of Philadelphia; physician to the Medico-Chirurgical Hospital; member of the American Medical Association, of the Pennsylvania and Minnesota State Medical Societies, the American Academy of Medicine, the British Medical Association; Fellow of the Medical Society of London, etc., etc. Fifth edition, thoroughly revised; 6¼ x 9½ inches; pages VII-770. Extra cloth, $4.00, net; sheep, $4.75, net. F. A. Davis Company, Publishers, 1914-16 Cherry St., Philadelphia.

The broad experience of the author in teaching the subject of materia medica has admirably adapted him for the preparation of a text book for students. In this the fifth edition we find that the author has embodied in a concise and comprehensive manner the essentials of materia medica. Nothing outside of the description of those drugs and preparations which are official in the pharmacopœias of the United States and Great Britain, together with some of their chemical modifications, is to be found in the work.

A careful examination of the work shows that the author has guarded against the introduction of nonessentials, and has presented only the matter

which is of prime importance to the student. This feature of the work, together with the skillful manner in which the preparations, pharmacology, physiological action, and therapy of the various drugs are presented, at once recommends the work as being of great value to the student of materia medica.

PHYSICAL DIAGNOSIS IN OBSTETRICS: A GUIDE IN ANTEPARTUM, PARTUM, AND POSTPARTUM EXAMINATIONS, FOR THE USE OF PHYSICIANS AND UNDERGRADUATES.— By Edward A. Ayers, M. D., Professor of Obstetrics in the New York Polyclinic; attending physician to the Mothers' and Babies' Hospital. With illustrations. Price, $2.00. 1901. E. B. Treat & Co., 241–243 West Twenty-third St., New York.

This work on physical diagnosis in obstetrics is another link in the chain of evidence that the study of medicine is a rapidly progressing science. The old-time theoretical teaching is rapidly becoming adumbrated by the vastly superior practical methods of teaching the various branches of medicine. The medical graduate of to-day, if he has been alive to his opportunities, is in a position to meet successfully the emergencies which he is likely to encounter. Such men as the author of this work have made this possible by giving to the student of medicine the benefit of their experiences in practical lines.

This work contains the most recent and valuable facts pertaining to physical diagnosis in obstetrics, with which every student and practitioner of medicine should be thoroughly familiar. The book is well illustrated with cuts showing the normal and abnormal positions of the fetus in utero, the contour of the abdomen during pregnancy, instruments, etc. We can safely recommend the work to both students and practitioners. The book is well printed and bound.

URINARY DIAGNOSIS AND TREATMENT. — By J. W. Wainwright, M. D., member of the American Medical Association, New York State Medical Association, New York County Medical Association, etc. Illustrated with numerous engravings and colored plates. Pages, 140. Price, $1.00 net.

This book gives not only all the usual methods of urinary examination, but introduces also a new feature in works of this character, *viz.*, a discussion of the clinical significance of the urinary findings and their practical application in treating the diseases of which they are symptomatic.

Among the subjects discussed are the following: Composition and Physical Character of the Urine; Normal Constituents of Urine; Abnormal Constituents; the Microscope and Microscopical Technique; Qualitative Analysis of Urinary Calculi; Bright's Disease, Diabetes, Gout, and Other Conditions and Their Treatment; Favorite Prescriptions, etc.

The New York School of Clinical Medicine, a post-graduate college for physicians, has just now opened a new department for the study of the constitutional effects of alcohol and other drugs.

An eminent Russian physician, in a paper read before the International Medical Congress held at Moscow, August, 1897, said: "The struggle against alcoholism merits as much attention on the part of the medical profession as that against the various epidemics, and the success of the struggle is impossible without the active sympathies of the medical profession."

Realizing the truth of the foregoing statement, the National Woman's Christian Temperance Union, at the beginning of this new century, appeals to physicians to aid in the efforts being made to remove as far as possible all tendencies and temptations toward the formation of the drink habit. The medical profession can wield a powerful influence by bringing to the knowledge of the people the consensus of scientific opinion and practical observation on the disastrous results which follow the habitual and indiscriminate use of alcohol.

Particularly would we ask physicians to warn parents against the home prescription of alcohol and against the use of proprietary medicines containing alcohol or other narcotic drugs, by showing them the danger, and by teaching them a better way.

We respectfully ask that this appeal be published in all medical journals, and that it be brought before national, State, and county medical societies, for discussion.

With profound respect for your honorable profession, and with hope for your active co-operation in this work, we are

Sincerely yours,

LILLIAN M. N. STEVENS,
President N. W. C. T. U.

SUSANNA M. D. FRY,
Corresponding Secretary, N. W. C. T. U.

TO THE PHYSICIANS OF THE UNITED STATES.

THE National Woman's Christian Temperance Union has been active for twenty-seven years in combating the evils of alcoholic liquor drinking. Among its most effective allies have been those physicians who do not prescribe alcoholic liquors, allowing alcohol a very limited sphere of usefulness, or none at all.

We are endeavoring to bring the teachings of such physicians to the people, and we believe that much good is being accomplished thereby. It is apparent, however, that if the evils of liquor drinking (ill health, poverty, insanity, and crime) are ever to be fully abated, the medical profession must take a more active part in this much-desired reform. They, more than any others, can disabuse the public mind of old-time errors concerning the use of or necessity for alcohol, either as a beverage or for medicinal purposes. It would seem to be the duty of those to whom the public looks for guidance in all things pertaining to health, to continue to make the most careful investigations of the nature of alcohol and its effects upon the human system, and to see to it that *their medical practice and teaching, as well as their personal example, is upon the side of safety.*

The Battle Creek Sanitarium

LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
NEWTON EVANS, M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR JANUARY.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
103 per cent.	4		4
100 " "	55	44	99
96 " "	20	18	38
93 " "	16	17	33
88 " "	1		1
85 " "	5	8	13
78 " "	4	4	8
71 " "	3	4	7
70 and below	1	5	6
Total	109	100	209

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	50	21	71
Between 4,500,000 and 5,000,000	22	26	48
" 4,000,000 " 4,500,000	18	21	39
" 3,500,000 " 4,000,000	8	15	23
" 3,000,000 " 3,500,000	3	3	6
" 2,500,000 " 3,000,000	2	3	5
Below 2,500,000	6	11	17
Total	109	100	209

Examination of Sputum.— There were 36 examinations made. Tubercle bacilli were found in 4 cases.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	40	74	6	55	23	45	69	60
Less than 10,000 bac.	13	24	5	45	24	47	42	36
Between 10,000 and 100,000 bac.					2	4	2	2
More than 100,000 bac.	1	2			2	4	2	2
Total	54	100	11	100	51	100	115	100

The patients were received from the following States and countries: Michigan, 20; Canada, 4; Ohio, 8; Wisconsin, 5; Iowa, 9; Illinois, 9; Utah, 1; Indiana, 19; Kentucky, 3; Ontario, 3; New York, 3; Montana, 2; Texas, 1; Georgia, 3; Minnesota, 3; Massachusetts, 1; West Virginia, 1; Kansas, 1; Missouri, 1; Tennessee, 3; Pennsylvania, 1; North Dakota, 1. Total, 115.

Urinary Laboratory.— Total number of specimens examined, 604; number of new cases, 184; number of cases having pus, 69; albumin, 24; mucus, 6; sugar, 8; blood, 5; casts, 4.

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MODERN MEDICINE

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ORIGINAL ARTICLES.

LOCAL OR PARTIAL HYDRIATIC MEASURES.

BY J. H. KELLOGG, M. D.,

Superintendent of the Battle Creek (Mich.) Sanitarium.

A VERY great variety of local or partial hydriatic applications is in use, each experienced practitioner of hydrotherapy employing some measures which he has especially devised or modified to meet his own views or convenience, or in the adaption of his resources to his needs. Thus, in the description of local or localized measures, the writer will not attempt even to mention all possible applications, but only the leading and typical forms and their principal modifications. Several new measures, the outgrowth of the writer's personal experience, are presented, but only such as have borne the test of actual use and have proved their efficiency.

In strict sense, all hydriatic applications are local or partial in character, since the most general measures, as a rain douche, an immersion or a vapor bath, act directly only upon the skin, thus immediately influencing only a small portion of the blood vessels and nerves of the body. However, an application to the entire cutaneous surface, though partial in an anatomical sense, becomes general through reflex action and reaction.

These general applications are often of service for securing purely local effects, as in the use of the hot bath in acute nephritis, which relieves the renal congestion by congesting the skin; the neutral bath to quiet the central nervous system; the wet-sheet rub to relieve cerebral congestion.

On the other hand, local or partial applications, while generally employed for purely local or localized effects, either at the seat of application or at some remote part by revulsive or derivative influence, likewise produce in many instances more or less decided general effects, as may be noted in the tonic influence of the running cold foot bath, the general sedative effects of prolonged cold applications to the head, the restorative and energizing effects of a cold douche to the spine, the excitant effects of very cold or very hot applications to almost any portion of the surface, even though the area be very limited.

The localized effects of partial applications depend upon a few well-established principles, which may be summed up as follows: —

1. *Reflex Relations.*— Every portion of the cutaneous surface is in special reflex relation with some internal organ or vascular area. The most important of these reflex relationships are the following: —

(1) The skin of the scalp, face, and back of the neck is in reflex relation with the brain. The circulation of the scalp is also immediately connected with the brain through the medium of the skull, the vessels of which anastomose with those of the scalp and those of the brain.

(2) The skin of the back is reflexly related to the centers of the spinal cord. This is also true of the entire skin surface of the trunk and limbs.

(3) The skin covering the neck is reflexly, through the spinal cord, related to the pharynx and the larynx.

(4) The upper dorsal region, the skin of the chest in front and behind, and the inner surface of the thighs, have special vasomotor reflex relation with the lungs.

(5) That portion of the chest wall overlying the heart (the precordia) is especially associated with the heart,— a fact often of priceless service.

(6) The skin covering the lower portion of the right chest is reflexly related to the liver.

(7) The skin surface of the lower left chest is associated with the spleen.

(8) The skin covering the lumbar re-

gion is reflexly associated with the uterus, ovaries, bladder, rectum, kidneys, and intestines.

(9) The skin covering the lower part of the sternum is especially associated with the kidneys.

(10) The dorsal spine is associated with the stomach, a fact which may often be made of great service in the suppression of nervous vomiting.

(11) The skin of the epigastrium has special relations with the stomach.

(12) The whole surface of the abdomen, and especially the umbilical region, is reflexly related to the intestines.

(13) The lower abdomen is associated with the uterus, bladder, colon, and rectum.

(14) The feet, and to a considerable extent the whole lower extremities, are associated with the brain, lungs, bladder, uterus, ovaries, and bowels.

(15) The skin covering the shoulders and upper portion of the back and the arms and hands is an area which is closely associated with both the cerebral and pulmonary circulations, and may be employed in producing most useful therapeutic effects both by the reflex influence of cold applications and by the derivative effects induced by hot applications.

2. *Internal Reaction.*— The changes induced in internal parts by applications to the surface, especially by cold applications, may not improperly be termed internal reaction. These changes are desirable sometimes to suppress or diminish, in other cases to encourage.

In general, it may be said that the more intense the external application, the more pronounced will be the internal reaction. The reaction of cold differs diametrically from the reaction following a hot application. The reaction following cold increases all kinds of vital work,—heart and vessel work, brain and nerve work, gland work, respiratory work, tissue building, oxidation, poison destruction, poison elimination, heat production. Heat is followed by decrease of vital work.

It is often desirable to lessen the internal reaction to cold. This may be done in several ways, as follows:—

(1) By applying water of a higher temperature, thus lessening the external reaction.

(2) By means of the Scotch douche or other analogous measures. The greater the extremes of heat and cold, the greater the internal reaction. By raising the temperature of the cold application and lowering that of the hot application, thus lessening the difference between the two extremes, the intensity of the internal reaction may be diminished.

In the use of the alternate douche, the greater the number of alternations, the greater the excitation induced.

Internal reaction may be diminished when alternate applications are employed, by graduation of the alternations,— increasing the difference between the extremes of heat and cold with each successive alternation, either by increasing the temperature of the hot application or lowering that of the cold application, or by changing both simultaneously.

(3) The graduated bath, either immersion or douche, lessens internal reaction and especially thermic reaction by the avoidance of an abrupt change of temperature. The zero of the temperature sense is gradually lowered by beginning the bath temperature near that of the body (98° to 100° F.) and gradually cooling to 90° during a period of from thirty to sixty seconds. The sensory impression made is thus greatly attenuated.

(4) By applying before the local application a general cold bath of some sort, the external and internal reactions may be generalized, and thus the local effect will be attenuated. The general application may be either a general douche or some form of nonpercutient application, as a wet-sheet pack, a wet-sheet rub, an affusion, or general friction, either moist or dry.

(5) We may precede the local application by the general Scotch douche.

(6) We may follow the local application with a general douche or other cold application whereby general external and internal reaction may be produced.

3. *Reflex Action.*— A cold application to the surface causes at first a brief contraction of the vessels in the internally related viscus as well as in the skin. This contraction is normally followed by reaction in both the skin and the internal parts. For the production of reflex effects the douche is the most powerful measure, but various other means may be employed, for instance, those named below:—

(1) Local cold affusion.

(2) Hot and cold affusion.

(3) Cold foot bath for from ten to twenty seconds, the water very cold and

not more than one fourth of an inch deep.

(4) Alternate foot bath.

(5) Cold sponging.

(6) Cold compress.

(7) Ice rubbing.

(8) Fomentation followed by ice rubbing.

(9) Fomentation followed by an ice compress for a few seconds.

(10) Hot sponge bath followed by ice-water sponging.

(11) Vapor douche followed by cold affusion, ice rub, or an ice compress.

The reflex effects resulting from localized hydriatic applications differ both in intensity and quality, according to the duration and temperature of the application.

4. *Fluxion.*— By the term "fluxion" is meant the movement of the blood. There are four modifications of blood movement to be considered:—

(1) *Increasing the rate of movement* of blood through an organ.

(2) *Diminishing the rate of movement* of blood through a part.

(3) *Increasing the volume* of blood in a part containing too little blood (anemia).

(4) *Diminishing the volume* of blood in a part containing too much blood (congestion, or hyperemia).

In the preceding paragraphs the rationale of increased rate of blood movement resulting from reflex hydriatic applications has been explained, as has also the production of passive congestion for derivative effects. It remains to consider more fully the rationale of the production of changes in the volume of blood by hydriatic means not acting reflexly.

When a cold application is made to the whole surface of the body, all the internal organs are thereby congested — after the first momentary contraction of their vessels has passed away — by the mechanical displacement of blood from the skin inward, or retrostasis. During the first instant after the general cold application, while the internal vessels are contracted, the surplus blood, chased out of the systemic circulation, finds temporary refuge, so to speak, in the veins and portal reservoir, from which, in the later moments, it is distributed among the internal organs. When the cold application is partial, however, this general retrostasis of blood does not occur except to a very limited extent, a very different readjustment of the blood distribution taking place. For example, if cold is applied to the lower part of the body, the blood vessels, both external and internal, contract, and the blood is driven out of the lower extremities, pelvis, and lower abdomen. At the same time, the vessels of the head, chest, and arms are dilated, and the volume of blood in these parts increased. The reverse is equally true. The umbilicus is the dividing line in this compensatory action. If cold is applied to one foot or hand, the effect is not, however, as might be supposed, to increase the volume of the blood in the other hand or foot, but to decrease it, as shown by Brown-Sequard, through reflex action. A cold compress or a percussion douche over the spine does not produce general internal congestion to any marked degree, but causes contraction of the spinal vessels, which by reaction is followed by active congestion if the application is short and intense, and so produces a powerful tonic effect through exciting the spinal centers.

By means of hot applications, effects the opposite to those following cold are produced. The dilation of the vessels of the legs following hot applications to these parts produces congestion of the vessels of the lower part of the body and anemia of the upper parts.

By the application of this principle, it is possible to combat either anemia or congestion of the brain, lungs, uterus, or other important vital parts. It should be said, however, that the principle is more often and more conveniently applicable to congestions and anemias of the upper parts of the body than to similar conditions of the lower parts, for the reason that intense congestion or anemia of the brain and lungs can not be induced with the same degree of safety with which we may congest the legs or lessen the blood supply of these parts.

Collateral Anemia and Hyperemia.— Where all the parts concerned are supplied by a common arterial trunk, reciprocal changes in the volume of blood occur between the superficial and the deeper parts. This relation exists between any muscle, joint, or bone and the overlying cutaneous area. It also exists between the overlying skin and the following organs: The brain, the spinal cord, the eyes, the ears, the serous lining of the pleural and peritoneal cavities, the

lungs, the kidneys, the uterus and ovaries in woman, the testicles and prostate in man. This relation between the skin and the uterus, ovaries, kidneys, bladder, and lungs is less intimate than between the muscles and joints; but clinical results as well as anatomical considerations indicate that such a relation really does exist, though more remote, and it is even possible to trace a very distinct and direct anatomical connection between the blood vessels of the liver, stomach, intestines, spleen, and pancreas, and the contiguous superficial parts. If in illustration of this principle, we apply a cold compress over a fleshy part, as the front of the thigh, the result will be the production of pronounced anemia of the skin and a corresponding hyperemia of the underlying quadriceps extensor femoris muscle. If, on the other hand, a hot compress or fomentation be applied instead, the result will be the diversion of blood to the skin and the production of anemia of the muscle.

It is by the application of this principle that we are able to combat inflammation, congestion, and pain in muscles and other deep parts which are directly connected with the skin through a common blood supply. By diverting the blood into the skin by means of a fomentation or other hot application, the congested or inflamed muscle, nerve, or joint may be relieved.

In not a few instances, the collaterally related parts are not contiguous. The relation of the blood vessels rather than the simple contiguity of the parts should be considered. Many examples of this might be given. The cutaneous vessels of the arms are collaterally related with the brain circulation through the vertebral branches of the subclavian; with the lungs through the superior intercostals; the legs and hips, with the head, by diverting blood into the abdominal aorta and its branches; the legs, with the pelvic viscera, by diverting blood into the external branch of the iliac.

The most powerful effects possible are obtained by measures which combine the principle of induced hyperemia of collaterally related parts with that of reflex stimulation of the controlling vasomotor centers. Fortunately, the cutaneous areas which may be utilized for these respective purposes are often distinct, so that there is no anatomical obstacle in the way of their simultaneous employment. Examples: The fomentation to the back of the chest with the cold compress to the front; a hot foot bath combined with a cold hypogastric compress.

Venous or passive hyperemia may likewise be induced as a means of draining collateral vascular areas. The means to be employed are the fomentation at a moderately high temperature (104° to 120°) and the protecting heating compress applied without change until the desired effect has been obtained. Venous congestion is produced in connection with the arterial hyperemia resulting from a hot application. It may also be induced simultaneously with arterial hyperemia by operating upon distinct areas.

The portal system constitutes a most important arrangement for modifying the volume of blood in the systemic system. It is capable of holding all the blood in the body; and having no valves, there is easy fluxion in and out through the four gateways by which it communicates with the systemic veins.

By means of induced collateral arterial hyperemia the arteries of a part are drained, the blood supply is lessened, and the tension lowered. By induced venous hyperemia the veins of the part interested are drained, and the movement of blood through the part is accelerated by lessening resistance. An inflamed part does not need less blood, but less tension, and especially the rapid removal of toxins, CO_2, and disabled leucocytes, and an abundant and constant supply of fresh and pure serum, oxygen, and active leucocytes.

In active visceral congestion, as in the first stage of an inflammation, collateral arterial hyperemia is especially indicated. In passive congestion, collateral venous hyperemia is especially useful, but the best effects will be obtained by the simultaneous application of these two procedures.

Induced venous hyperemia may render most valuable service in many cases by association with cold compresses applied to another cutaneous area which is reflexly associated with the actively congested internal organ under consideration.

Cutaneous Areas Which May Be Utilized for Derivative Effects.— The anatomical arrangements whereby derivative effects in favor of various internal parts may be produced by hydriatic measures are scarcely less elaborate and interesting than those by which reflex effects upon

both blood and nerve supply are secured. The following are only a few of the more important and clearly established collateral relationships whereby useful derivative effects in favor of important vital organs may be induced through the application of heat or combined heat and cold, the skin surfaces named indicating the areas to which the application is to be made, and the blood vessels the channels through which the fluxion takes place (heat produces hyperemia of the skin, and collateral anemia of the deep structures which are vascularly related thereto, while cold applications to the same surfaces induce anemia of the skin and hyperemia of the deep-lying parts):—

The Brain.—The scalp, through the direct vascular connection between the cutaneous vessels and the vessels of the dura mater; the skin by diverting the blood into cutaneous branches of the external carotid. This method is rarely practical, however, as the bones of the skull and face are so good conductors that the brain is quickly heated by a hot application, and thus the desired derivative effect is lost. The most practical method of lessening the blood supply of the brain is by means of alternate compresses or the reflex influence of cold applications. Hot applications must be brief.

Short hot applications to the back of the neck may divert blood from the cerebral branches of the vertebral arteries into the cervical, influencing especially the cerebellum.

Hot applications to the hands and arms may diminish cerebral congestion by diverting blood from the vertebral arteries, which are branches of the subclavian. If made very hot, favorable reflex effects will also be produced during the first moments of the application.

Warm applications about the neck, even warm wrappings, congest the brain by inducing dilatation of the carotid and vertebral arteries (cold produces the opposite effect). Prolonged applications to the back of the neck congest the brain, as the vertebral arteries give off few cutaneous branches, so that their dilatation by prolonged warmth results in an increased supply of blood to the brain.

The direct connections between the venous sinuses of the brain and the cutaneous veins of the scalp afford opportunity for the relief of passive congestion of the brain by dilating the cutaneous veins, and thus enlarging the channels leading to the heart. The anatomical arrangements whereby the blood entering the cranium may be conveyed back to the heart through the cutaneous veins of the head are numerous and highly interesting. According to Woolsey the following relations exist:—

"(*a*) The longitudinal sinus communicates with the temporal veins through one or both parietal foramina when present, and, in the child, with the veins of the nose through the foramen cecum.

"(*b*) The lateral sinus is connected with the occipital (or posterior auricular) vein through the mastoid foramen (the largest and most constant emissary), and sometimes with the vertebral vein through the posterior condylar foramen.

"(*c*) The cavernous sinus communicates with the pterygoid plexus through the foramen of Vesalius and the foramen ovale, as well as through the inferior ophthalmic vein; with the pharyngeal plexus through the foramen lacerum medium; and with the internal jugular vein by the carotid plexus through the carotid canal.

"(*d*) The occipital sinus communicates with the vertebral and extraspinal veins through the anterior condylar foramen.

"(*e*) A small vein occasionally passes to the torcular through a foramen in the occipital bone near the external occipital protuberance."

By hot or alternate hot and cold applications to the areas above indicated, any one of the principal sinuses of the brain may be drained into the veins of the adjacent skin. For example:—

1. To influence the longitudinal sinus, applications should be made to the parietal region, that is, the sides of the head.

2. The lateral sinus may be drained by applications to the back part of the head, especially the areas just behind the ears.

3. The cavernous sinus may be drained by applications over the ear, face, and side of the neck.

4. Blood may be diverted from the occipital sinus by applications to the back of the neck.

Applications made to the back of the neck influence especially the cerebellum, dilating the vertebral and the posterior jugular veins.

Applications to the side of the head and neck drain the brain through the internal jugular.

The Spine.— The skin of the back may be used to drain the spinal cord, through the dorsal branches of the aortic intercostals, which nourish the cord.

The dorsi-spinal veins, the superficial veins of the back, form a plexus which connects with the vertebral veins of the neck, with the intercostal in the dorsal region, the lumbar and sacral veins lower down. The dense plexuses formed by these veins in the skin, and especially about the spinous processes, form a capacious reservoir into which the blood may be diverted from the venous plexuses which occupy the spinal canal (meningo-rachidian) with which they are connected by anastomosing branches passing through the intervertebral foramina and joining the vertebral, intercostal, lumbar, and sacral veins.

The veins of the spinal cord itself join the vertebral veins at the base of the skull. Applications intended to influence the blood supply of the vertebræ or structures connected with them should be applied the whole length of the spinal column. Applications directed toward the envelopes of the spinal cord should extend from the base of the brain to about the middle of the lumbar region. Applications intended to influence the spinal cord itself may cover the entire spinal area, but care must be taken to give particular attention to the extreme upper portion, including the lower and back part of the scalp.

The Eyeball.— The skin of the eyelids and forehead drain the eyeball by dilating the supraorbital branch of the ophthalmic, a branch of the internal carotid.

The Middle Ear.— The whole side of the head and face, diverting blood from the internal carotid and internal maxillary. If the hot compress extends below the jaw, the common carotid will be dilated. An ice-bag below the jaw with the fomentation increases its effects by contracting the carotid.

The Internal Ear.—Receiving its blood supply from the vertebral artery, a branch of the subclavian, the internal ear is not influenced by heat over the ear, but may be relieved, when congested, by warm applications to the arms, and cold applications to the head and back of the neck, thus diverting the blood into the arms from the vertebral arteries, while at the same time contracting the vertebral arteries by a proximal cold compress or an ice-bag to the back of the neck.

The Nasal Cavity.— The face and sides of the head, diverting the blood from the internal carotid and the internal maxillary.

The Pharynx.— The whole face, diverting from the internal maxillary and the ascending pharyngeal.

The Larynx.—The skin of the neck overlying the larynx and the arms, diverting the blood from the internal branches of the carotid and the subclavian into their external branches (the superior and inferior thyroids). The arms and back, and the sides of the upper chest may also be utilized. Chilling of the arms and shoulders should be avoided.

The Lungs.—The aim is to influence the bronchial arteries, the nutrient vessels of the lungs. The collaterally related cutaneous surfaces are:—

1. The anterior chest wall from the clavicle to the umbilicus, influencing especially the pleura (also the pericardium) through the cutaneous branches of the aortic intercostals.

2. The pleura of the posterior chest wall, through the cutaneous branches of the aortic intercostals.

3. The arms, through the diversion of blood from the superior intercostal, a branch of the subclavian, influencing especially the pleura of the upper part of the chest. Induced hyperemia of the arms also relieves congestion of the pleura of the anterior wall of the chest by diverting blood from the internal mammary, a branch of the subclavian.

4. A direct relation exists between the bronchial arteries and the skin of the right chest, through the fact that the right bronchial arteries arise from the aortic intercostals. The relation between the left bronchial arteries and the skin circulation is less direct; hence the importance of making applications to the whole chest in the hydriatic treatment of pneumonia, though one lung only may be affected. It is especially important that the application should be made to the back of the chest.

It is interesting to recall the fact of the connection of the bronchial arteries with the pulmonary capillary plexus and veins, whereby arterial blood passing through the lungs may return at once to the left heart without entering the systemic venous system, and without visiting the right side of the heart, forming thus a sort of second pulmonary circuit, very small, but possibly very useful in many

conditions for carrying on oxygenation of the blood independently of the pulmonary circulation proper.

5. Through the free anastomosis of the tracheal branches of the inferior thyroid and the bronchial arteries, the nutrient vessels of the lungs may be influenced by applications made to the front part of the neck. Cold applications made to this region will tend strongly to concentrate the blood in the lungs. By warm or alternate warm and cold applications the blood may be diverted from the lungs by facilitating the movement of blood through the collateral circulations, and passive congestion may be relieved.

6. The veins which return the blood from the nutritive arteries (bronchial) of the lungs, empty on the right side into the azygos vein; on the left side either into the superior intercostal or the azygos vein. The intercostal veins are thus on both sides so connected with the bronchial veins that when dilated by hot or alternate applications the blood stream through the lungs may be accelerated, thus relieving the passive congestion, a condition which constantly exists in pneumonia after the first stage, and in cardiac disease accompanied by dyspnea due to deficient compensation. Applications to be efficacious for this purpose must cover the whole thoracic cage, and especially the back and sides, as the intercostal vessels with which the bronchial arteries are associated, are chiefly distributed to these portions of the chest. An appreciation of these anatomical relations is deficient to impress the necessity for maintaining active circulation of the skin in pneumonia, and allowing opportunity for complete reaction to take place at short intervals when cold applications are made. If continuous cold applications are made to the front of the chest, care must be taken to maintain warmth, and to prevent collateral pulmonary congestion by applying heat behind.

The Kidneys.— The loins, through the renal branches of the lumbar arteries.

The Bladder, the Uterus and Adnexa, and the Prostate.— The sacrum, buttocks, perineum, external genitals, inner surface of thighs, groins, suprapubic region, through the sacral, gluteal, obturator, sciatic, inferior hemorrhoidal, superficial perineal, deep circumflex iliac, and deep epigastric arteries, derived from the internal iliac.

The Rectum.— The anal region and the perineum, through the inferior hemorrhoidal, superficial perineal, and other branches of the internal pudic.

The Stomach.— The arterial circulation of the stomach may be influenced through the free anastomosis of the gastric artery with the esophageal arteries, which in turn anastomose with the inferior thyroid, a branch of the subclavian. An arterial connection also exists between the vessels of the stomach and of the internal mammary, through the phrenic artery. The venous circulation of the stomach is connected with the skin through anastomosis of the gastric with the esophageal veins, which empty into the right azygos vein. The last-named vein also receives the intercostal veins, especially those draining the skin covering the sides and back of the chest. Applications intended to influence the arterial circulation of the stomach should be of such size as to cover the lower third of the sternum, the cartilage of the lower ribs, and the space between these structures and the umbilicus. When it is desired to influence the venous circulation, as in chronic gastritis, cardiac insufficiency, and hepatic cirrhosis, the applications are made to the back and sides of the chest.

(To be concluded.)

THE HYDRIATIC TREATMENT OF TYPHOID FEVER: REPORT OF A CASE.

BY CHAS. E. STEWART, M. D.,
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MR. F. W., Michigan, aged twenty-four, laborer, single, applied for treatment Oct. 21, 1900. The patient's father died of paralysis. As a child the patient was robust, and had continued well until eight weeks before the date of his admission, when he had "chills and fever," the chills continuing for several nights, and being followed by profuse perspiration. He soon recovered, and felt comparatively well for about a month. A week before coming here, he rapidly grew worse, had fever, and considerable pain in the abdomen; bowels were regular; appetite poor; sleep disturbed.

Upon his arrival, after a journey of nearly four hundred miles, he was in a very weakened condition, temperature

104° F., pulse 120. He was in a sort of stupor, and in an incoherent manner answered the questions asked him. He was at once put to bed and placed in charge of a trained male nurse.

A physical examination showed him to be fairly well developed; muscles firm; skin hot and dry; tongue red about the edges, center coated, fissured, and dry; sordes on teeth and lips; breathing rapid; apex-beat in fourth interspace; left lobe of liver and spleen enlarged; abdomen tender and tympanitic. The patient had a typical typhoid appearance. Widal's reaction was present.

An antiseptic dietary was at once instituted, and hydriatic measures were employed to combat the existing pathological conditions. From the time of his arrival until convalescence was fully established, his diet consisted principally of fresh fruit juices, gluten gruel, malted nuts, vegetable bouillon, and protose broth. Some cooked fruit, such as the pulp of baked sweet apples and prune marmalade, was allowed.

The following is a synopsis of the daily report of the nurse, giving hydriatic measures employed, results, and temperatures: —

October 21: At 9 P. M. patient's temperature was 104°. Cold enema, temperature 80° F., was given; also cold compress to head, and wet-sheet pack. This was followed by cold compresses to the abdomen, changed every fifteen minutes, interrupted by a short fomentation to the abdomen every two hours. The patient slept at intervals.

October 22: At 6 A. M., temperature was 101°. Cold enemas were given every two hours as long as the temperature remained above 101° F. As soon as the temperature reached 102°, the wet-sheet pack was used, which invariably reduced the temperature a degree or more. The cold compresses to the head and abdomen were employed as on the previous day. At 1 P. M., the temperature was 102.1° F.; at 6 P. M., 101.6°.

October 23: Temperature at 6 A. M. was 100.8°; at 1 P. M., 101.8°; at 6 P. M., 102.6°. By 8 P. M., patient's temperature had reached 103°, but dropped to 101.6° after the cold enema, fomentation to the spine, and cold mitten friction. He slept several hours during the night.

From this time until his temperature remained normal throughout the day, which was November 21, just one month from his admission, the highest temperature reached was 102.8° F. The treatment employed during the period of pyrexia was practically the same as previously outlined.

From November 21 until his dismissal, a more liberal dietary was allowed, and tonic treatment employed. From this date until his dismissal, November 29, he was taken to the bathroom for treatment, which consisted of fomentations to the spine, cold mitten friction, massage, hydro-electric baths, Swedish shampoos, douches, general and local faradization, and salt glows. During the last week of his stay here, he gained at the rate of a pound a day.

This case illustrates but one of the many in which the high temperature, with its accompanying destructive metabolism, can be controlled by hydriatic measures, which do not cause the patient the same degree of discomfort as the Brand bath. These measures can be employed in any home where hot and cold water is available, and may be used to advantage in conjunction with the graduated bath, which is to be used when the other measures fail to keep the temperature sufficiently low.

Tuberculosis Hospital for New York.— A bill has lately been introduced in the Senate by Senator Davis, appropriating $100,000 for the erection of buildings for the New York State Hospital for the Treatment of Incipient Pulmonary Tuberculosis. An additional $20,000 is appropriated for the equipment and furnishings. The buildings are to be of sufficient size to accommodate one hundred patients, besides officers and attendants.

Anti-Cigarette Bill for Utah.— Representative Belch has introduced into the Utah legislature an anti-cigarette bill providing for a fine of not less than ten dollars nor more than two hundred dollars to be imposed upon any person, firm, or corporation that sells, gives away, or otherwise disposes of cigarettes or cigarette paper to any person, no matter what age he be. The bill also provides for the arrest and fining of persons smoking cigarettes.

TRANSLATIONS AND ABSTRACTS.

[The articles in this department are prepared expressly for this journal.]

The Relative Importance of Valvular and Muscular Lesions in Diseases of the Heart.— Solomon Solis-Cohen, M. D., in a paper presented to the Section on the Practice of Medicine, at the fifty-first annual meeting of the American Medical Association, held at Atlantic City, N. J., June 5–8, 1900 (*Jour. Am. Med. Asso.*, Jan. 12, 1901), concludes with the following summary:—

1. In the great majority of cases of chronic disease of the heart, the exact site and nature of the valvular lesion, while always to be taken into consideration in treatment, are of less importance therapeutically and prognostically than the state of the cardiac muscles.

2. The most important exception to this general rule is in the case of mitral stenosis with great narrowing. Aconite is often of use in this condition to reduce the excessive muscular effort, even when compensatory hypertrophy has not become sufficient.

3. In many cases in which no evidence of valvular lesion can be detected during life, and in some of which slight valvular alterations, in other normal valves, are demonstrable after death, there exist rational signs of cardiac incompetence which are due to diseases of the cardiac muscle.

4. The symptoms and physical signs of cardiac myopathy are inconstant, and in the early history of the case may be slight. In the absence of valvular lesions, intermittence or irregularities of the pulse or apex-beat, disturbance of rate or rhythm by slight causes, and recurrent pain referred to the precordium, in non-hysterical and nonneurasthenic subjects, are the principal local symptoms calling attention to the disease of the cardiac muscle. Tinnitus, vertigo, dyspnea, venous ectases, visceral congestion, edema, and other evidences of circulatory disturbance may be slight and escape attention until sought for. There is usually impurity or weakness of the first sound of the heart, with approximation of the two sounds in quality or relative accentuation of the second sound; later, embryocardia and gallop rhythm may develop.

5. Gout, syphilis, alcohol and tobacco, tea and coffee, sexual excesses, mental strain and physical overwork, either in serious pursuits or sports, are among the chief provocations of disease of the myocardium, apart from those lesions secondary to the acute infections or consecutive to nephritis or valvular disease. Among the acute infections, influenza is a frequent cause of cardiac muscular disease.

6. Other than the general diagnosis of disease of the myocardium, there is not yet sufficient knowledge of clinical signs to permit accurate recognition antemortem of the pathological nature of the lesion.

7. The diagnosis between neurasthenia of the heart and diseases of the myocardium may be difficult.

8. The chief importance of the subject lies in the avoidance of error (*a*) in the prognosis and treatment of valvular disease, which may be overtreated or undertreated through failure to estimate properly the condition of the muscle; (*b*) in the recognition of serious lesion of the muscular structure of the heart in cases that have been supposed to be normal because of the absence of valvular murmurs; (*c*) in the distinction between organic muscular lesions and functional disturbances, and in the realization of the fact that the latter may lead to the former.

9. In treatment, judicious regulation of diet, rest, and exercise; avoidance of exciting causes and excesses of any kind; the good functional condition of the skin and eliminative organs, are of the first importance. Warm, saline, carbonated baths and, in some cases, gentle massage and resistance exercises carefully adapted to the individual case are of great benefit. The writer mentions a number of drugs which are useful in such cases. Of such drugs he considers nitroglycerin the most important.

Clinical Varieties of Bright's Disease.— Dr. J. R. Bradford (*Lancet*, Jan. 5, 1901), in classifying Bright's disease clinically, recognizes three forms, namely, the acute, the chronic, and the latent; understanding by the last, the condition in which, notwithstanding the existence of serious renal disease, symptoms of ill health are either absent or very trivial. In making this classification, nephritis

must be separated, and also granular kidney. Although there is a great resemblance in the etiology and in the morbid anatomy between acute nephritis and acute Bright's disease, yet there are considerable clinical differences. Dropsy is usually absent in acute nephritis, the symptoms being entirely urinary, and the process being developed early in the course of the primary causative affection (scarlet fever, etc.). The mere occurrence of the secretion of a concentrated urine loaded with albumin, and perhaps containing blood, is sufficient the di agnosis of acute Bright's disease. The matter may be put in a different way by recognizing two varieties of acute Bright's disease,— one with dropsy, and the other without.

At the present day the old view, that chronic Bright's disease was generally the sequel of the acute disorder, is no longer held with the tenacity that it formerly was, and it is generally recognized that a great many cases of chronic Bright's disease, if not the majority, are chronic and insidious from the outset. Clinically, two varieties of the chronic form may be recognized. One is a condition in which the patient suffers from dropsy, and passes a scanty and highly albuminous urine loaded with casts. The other variety, which is also exceedingly common, is where the patient presents no signs of dropsy, and where, notwithstanding the fact that the urine is highly albuminous, the quantity is not greatly diminished, and in some cases is considerably increased. The patient complains either of anemia and weakness, or of a circulatory disturbance due to high tension. There may be great emaciation, and pigmentation of the skin is present in some cases. The first form is due to what is called "large white kidney;" the second to "contracted white kidney." Most cases of "latent" Bright's disease come under the second head; no serious symptoms of ill health are presented until the onset of uremia.

Uremia in one or other of its forms may be met with in any destructive disease of the kidney, but the large proportion of cases are associated with contracted white kidney. It is here remarkable not only for the suddenness of its onset and the violence of its symptoms, but also for its marked fatality. In acute Bright's disease, on the other hand, uremia is not nearly so fatal. Chronic Bright's disease may not only be chronic from the outset, but also the two varieties of chronic Bright's disease are not necessarily different stages in one and the same morbid process, but represent rather the different effects of perhaps the same morbid process.— *New York Medical Journal.*

New Method of Treating Nasal and Naso-Pharyngeal Affections by Applications of Hot Air.— M. Lermoyez and G. Mahu (Paris) say that hot air has not up to the present been utilized in the treatment of the diseases of the upper air passages except in the form of inhalations, a coarse method which causes moist air, the temperature of which is hardly above that of the surrounding air, to circulate in the nasal fossæ. They propose to apply to circumscribed areas of the mucous membrane, currents of dry air superheated to a temperature of 80° C. to 100° C., a method which recalls those employed by Holländer and Jayle in dermatology and in gynecology. The supply of air under pressure is furnished by steel tubes containing the air under a pressure of 120 atmospheres; the latter is heated in a metallic worm, and it is conducted to its destination by a supple metallic tube, with a double coating of asbestos. At the end of this tube are screwed canulæ of various sizes and shapes, according as it is desired to apply hot air to the turbinates, at the Eustachian openings, or in the rear. At the base of the canula there is attached a regulator of the temperature and pressure.

Applications of hot air are made under the control of the vision, with a head mirror and speculum; sitting lasts two minutes and is repeated two or three times a week. As a rule, from eight to twelve sittings are necessary to obtain a good result. This treatment is perfectly painless. The entrance of the hot air brings about an intense retraction of the mucous membrane, which is soon followed by an abundant watery, defensive secretion which ceases in a few moments. The value and effect produced by the treatment shows itself next; at first temporary, it tends to become permanent. Lermoyez and Mahu have especially succeeded with applications of hot air in cases of chronic congested coryza with intermittent nasal obstruction. Hot air gives remarkable,

as well as lasting results, provided there is not yet angiomatous degeneration of the nasal mucous membrane. Sneezing and other nervous symptoms of spasmodic coryzas are rapidly suppressed. The flow of nasal hydrorrhea is dried, and the nasal mucosa brought back to its normal objective state. In hay fever, in which the experience of these men is still more recent, applications of hot air seem only to relieve the attacks. Finally, they give good results in aural troubles, deafness, and tinnitus, associated with catarrh of the nose and of the naso-pharynx; otalgia gives way to them almost immediately. An attempt to make this treatment the panacea of diseases of the nose would be to condemn it to a rapid loss of all consideration. It is useful to state that this treatment has, up to the present, given no result in ozena, purulent catarrh, nasal lupus, true hypertrophic rhinitis, no more than in all those nasal and naso-pharyngeal diseases which justify surgical treatment. — *The Laryngoscope, January, 1901.*

Treatment of Simple Fractures.— Bennett (*British Medical Journal*) concludes a discussion of this question as follows: —

1. The treatment of simple fractures at present, although less stereotyped than hitherto, is still conducted generally too much upon lines which are traditional rather than rational.

2. The use of splints for long periods is disadvantageous, especially in the form of plaster of Paris and the like.

3. Speaking generally, the earlier movements of the joints above and below the fracture in a long bone are used, the shorter is the time occupied in recovery.

4. The legitimate scope of the operative treatment of simple fracture is limited, and should be confined to (*a*) cases which are otherwise unmanageable; (*b*) special cases, such, for example, as certain spiral and oblique fractures, mainly of the tibia; and (*c*) certain fractures near joints in adults, notably of the humerus at the elbow.

5. The operative treatment of recent fracture of the patella is by no means so generally satisfactory or so free from risk as published cases would tend to show; and further, in cases in which the separation of the fragments does not exceed half or even three quarters of an inch, as good results for practical purposes are usually obtainable without operation, although less rapidly.

6. The use of massage and passive movements immediately in simple fracture, when the circumstances of the patient and of the practitioner admit of it, either in its entirety or with modifications, is, in the majority of cases, the best means of effecting a rapid and useful recovery.

7. The tendency of late has been to exaggerate the degree of disability and diminution in wage-earning capacity following upon simple fractures.

8. Although no pains should be spared in obtaining perfect position of the fracture ends, moderate displacement, provided it is not rotary, is not necessarily followed by any disability if care be taken by the use of early movements to prevent any matting of the parts around the fracture; in other words, the disability which follows in certain cases in which the position of the united fragments is not ideal, is due, not to the bony deformity, but to the adhesion of the soft parts around, which is easily preventable.

9. Having regard to the unavoidable modifications which must be dictated by the circumstances, social and otherwise, of the patient, and by the facilities possessed by the practitioner, no one method of treatment for simple fractures can be insisted upon for routine use, even in cases in which the local conditions are precisely alike. — *Medical Standard, December, 1900.*

Tuberculosis and Marriage.—Gerhardt (*Zeitschrift für Tuberkulose und Heilstättenwesen*, September, 1900) discusses the responsibility of the physician in regard to the betrothal and marriage of tuberculous individuals; and states that while some medical men oppose marriage among these individuals under all circumstances, others believe that conditions might and do exist which may justify such marriage by insuring better care and nursing.

If marriage occurs, a tuberculous wife runs a greater risk than a tuberculous husband, because of prejudicial effects of pregnancy, parturition, and lactation upon the course of the disease. In 1850 Grisolle took up the consideration of this subject, being, perhaps, the first

author to publish definite data, his material comprising the subsequent histories of twenty-seven tuberculous women after marriage and childbirth. Twelve of these women who were past the first stage of consumption, lived, on an average, four months each after delivery. Ten women in the first stage or before its full development, were made worse in two cases, the disease pursued its course unchanged in three cases, while the other five actually seemed benefited by childbirth.

After the publication of Grisolle's paper, a considerable literature sprang up on the relationship of tuberculosis to matrimony. One of the most commendable, and at the same time little known studies on one phase of this subject, is that of Sir Hermann Weber, who followed up the fate of sixty-eight tuberculous individuals who had married healthy men or women. Of the twenty-nine sound males who married consumptive females, a few became tuberculous; but of thirty-nine healthy women who married consumptive men, no fewer than eighteen became infected, and the disease appeared to run its course in these cases with unusual rapidity.—*Journal of Tuberculosis.*

The Effect of Mastication in Influencing Gastric Secretion.— Max Schreuer and Alfred Riegel (*Zeitschrift für Diätetische u. Physikalische Therapie*, No. 6, Vol. IV, 1900), in order to determine in how far the secretion of gastric juice is influenced by the mastication of food, gave test-meals of various composition, and then examined the stomach contents after longer or shorter intervals of time had elapsed. The food was given in various ways; being chewed and swallowed as usual, or artificially subdivided and put into the stomach through a tube, or being chewed and then expectorated without swallowing. The results showed that the act of mastication is capable of directly modifying the activity of the gastric glands and that this is independent of the chemical stimulation produced by the saliva swallowed. When the material tested consisted of carbohydrates, it was found that the exclusion of mastication was followed by a more or less considerable deficiency in the hydrochloric-acid values, while when the meal consisted of proteids (meats, hard-boiled eggs), the normal or hyperacid stomach reacted differently from one in which subacidity was present. In consequence of the greater degree of stimulation produced by these substances, the normal or hyperacid stomach is able to compensate for the HCl deficit attending the omission of the act of chewing, while the subacid stomach is not capable of this, but shows marked variation from the normal after the reception through a tube of artificially masticated food.—*Medical Record, Jan. 5, 1901.*

Self-Intoxication as a Result of Fatigue of Nerve and Muscle: Organotherapy.— Dr. A. V. Poehl (*Vratch*, December 9 (O. S. 21), 1900) has examined the urines of race-riders on bicycles, and found that overexertion is always accompanied by a certain degree of self-intoxication. He found that the relation of the nitrogen of the urea to the total nitrogen of the urine — the so-called coefficient of oxidation — was diminished; that the proportion of uric acid to that of phosphoric acid was markedly increased; that the proportion of phosphoric acid which existed as sodium phosphate to the total amount of phosphoric acid was increased, and that the absolute osmotic pressure of urine fell considerably. These chemical facts show that the energy of oxidation is diminished by fatigue, and that in overexertion the alkalinity of the tissue-fluids is diminished, the quantity of intermediate products containing nitrogen is increased, while the osmotic pressure of the body-fluids is lowered, and their metabolism retarded. This writer also found in bicyclists who participated in a recent long-distance race from St. Petersburg to Moscow, congestion of the kidneys, and not only hyaline, but also finely granular casts. He attributes these effects of fatigue on the kidneys to self-intoxication due to an enfeebled internal oxidation. He also investigated the urines of a number of young men engaged in serious studies, and found that mental exertion produces very similar effects on the metabolism, and results in self-intoxication. He found, however, that in these cases, there were, in addition to the changes detailed under muscular fatigue, a relative diminution of the chlorides (as compared with the amount of urea) and a relative increase of the sulphuric acids. The first is a sign which accompanies anemia; the

second indicates derangements in the process of fermentation in the digestive tract. The treatment of both mental and physical overexertion should therefore aim to increase the internal respiration and the alkalinity of the body-fluids. — *New York Medical Journal.*

The Treatment of Neurasthenia.— Dr. Daniel R. Brower (*Jour. of the Am. Med. Asso.*) says that neurasthenia is a pathological fatigue arising most frequently from gastrointestinal intoxication. The vasomotor mechanism is the first to show the effect, and the degree of disturbance in vascular tension is a great aid in prognosis. Partial rest is necessary, and recuperation must come through digestible and assimilable diet. Electricity is of value, and sponge baths, gradually lowered to 50° F., prolonged for about one hour, are a necessary part of the treatment proposed by Dr. Weir Mitchell. The European trip has been very detrimental to several of the writer's patients. No matter what special line of treatment is adopted, however, it is extremely important to keep the patient busy in his efforts at cure, and a daily schedule of the therapeutic work should be furnished him.— *New York Medical Journal, Feb. 2, 1901.*

The Preponderating Role of Autointoxication in Periodic and Aperiodic Coryza — Therapeutic Deduction — Eleven Cases.— Mounier (Paris) was enabled to follow in all details for years a case of spasmodic rhino-bronchitis with paroxysms in many, and cured it in a few weeks by an appropriate simple diet.

The ten other cases with complete cure or considerable improvement are a confirmation of the importance of autointoxication (gastrointestinal) in the two forms of spasmodic coryza.

The elimination of toxins by the Schneiderian membrane and the glands of the respiratory system explains: —

1. The attacks of aperiodic coryza.

2. The exceeding susceptibility of the nasal and bronchial mucosa to external excitations in coryza clearly periodic.

A diet must, therefore, be the basis of all treatment of a serious nature.

Surgical intervention on the turbinates and deflections of the septum or on the hypertrophied tissues of the naso-pharynx must not be neglected on that account, especially in hay fever.— *The Laryngoscope, January, 1901.*

Ophthalmia Neonatorum.—Dr. John E. Weekes (*American Gynecological and Obstetrical Journal*, November) recommends the following: (*a*) Prophylactic. Dropping one drop of a two-per-cent solution of silver nitrate in each eye immediately after birth. (*b*) Actual.

1. Frequent flushing with a three-per-cent boric acid solution, taking care not to press the eyeball or abrade the cornea.

2. Pieces of linen laid on a cake of ice and then on the eye, to be changed as soon as they become warm, this treatment to be carried out from one to four hours at a time three times a day. The object is to bring the local temperature to a point unfavorable to the growth of the gonococcus. It should be discontinued when the swelling in the lids subsides.

3. Antiseptics, applied once daily. Silver nitrate, ½ to 2 per cent; hydrarg. bichlor., 1–5,000; protagol, 20–40 per cent; formalin, 1–3,000. The writer's preference is for a one-per-cent solution of nitrate of silver applied to the whole surface of the conjunctivæ once a day.

4. Constitutional treatment to improve the general health of the child.

The Risks of Injection of Cocain into the Spinal Canal.— Goïlav (*Bull. et. Mém. de la Soc. de Chir. de Bucarest*, No. 5, 1900) states that his personal experience of the injection of solutions of cocain into the spinal canal has led him to form a very unfavorable opinion of this method, which he regards as more dangerous than the administration of chloroform or ether. He reports two cases in support of this assertion, in one of which the injection of cocain between the fourth and fifth lumbar vertebræ fifteen minutes before amputation of the leg, was followed by symptoms of intense poisoning, and after an interval of twenty hours, by the death of the patient. In the second case the patient, who ultimately recovered, was at "death's door" for about three days. These cases, it must be confessed, do not support strong

and general objections to the use of cocain, as in both, the patients were of advanced age, and the subjects of marked senile degeneration of the blood vessels. The writer acknowledges that in cases of obliterating arteritis complicated with arteriosclerosis, and with thickening of the coats of the aorta, the selection of the intra-spinal injection of cocain as an anesthetic application can not be regarded as a happy one. He holds also that this use of cocain is contraindicated in cases of renal disease.— *British Medical Journal, Jan. 19, 1901.*

The Abortive Treatment of Acute Mastoiditis. — James F. Mc Kernon, *Medical News*, No. 1,441), in the treatment of this disorder, obtains satisfactory results by the following method: When mastoiditis is threatened, if there is not already sufficient drainage of the middle ear, the natural opening is enlarged freely, the incision being carried, if necessary, into Shrapnel's membrane, and even still further into the upper wall of the canal. The patient is then placed in bed, where he must remain in perfect quiet, an ice-coil is fitted about the mastoid region, a purgative is administered, and finally the canal is irrigated every two or three hours with warm bichloride solution (1–4,000). The diet must be restricted to liquids. The coil should be taken off at the end of twenty-four hours. If an examination reveals that the inflammatory process is not practically cut short, cold must be reapplied for an additional twelve hours, and the other features of the management should also be continued. After thirty-six hours of this treatment, a very small proportion of cases may require still further recourse to the abortive plan, but in the great majority of cases, convalescence is well under way even after the first twenty-four hours, and at the expiration of a week's time, most patients are not only recovered, but they will remain fully cured.

Influence of Alcohol upon Population.— Arrivé (*Thesis*, Paris, 1900) has collected statistics of 402 French families which furnish 1,648 conceptions. Syphilis was eliminated, and tubercular history carefully sought for. Alcoholism appeared not to influence fecundity, unless the parents were the issue of alcoholic progenitors, in which case sterility was found to be frequent in the first and to increase in subsequent generations. Alcoholism of the parents leads to premature birth, and is a more active abortifacient than tuberculosis; it increases the number of still births. The children of alcoholic parents die most often of meningitis or congenital feebleness. Alcoholism causes physical and mental degeneration of many descendants.— *American Journal of Obstetrics and Diseases of Women and Children, January, 1901.*

Treatment of Nocturnal Enuresis by Massage.— Herbsmann (*Medicinische Woch.*, No. 37, 1900), in giving this treatment, first moves the surface of the index finger transversely across the neck of the bladder, and then in a longitudinal direction. These movements are used at first gently, later on, more forcibly. After this has been done for two minutes, the tip of the index finger is pressed against the neck steadily for another half minute.

The foregoing treatment has been very successfully employed even in some cases of very long standing, one of the patients being eighteen and another fifteen years of age, and both had been troubled with the affection since childhood. A cure was effected in from four to six sittings. Herbsmann believes that this treatment improves the innervation of the vesical sphincters.

Light Therapy and Electric-Light Baths.— Dr. Max Heim (*Deutsche Medisinal-Zeitung*, Dec. 19, 1900) says that the influence of electric light on the activity of the cells and increased metabolism is absolutely proved. Chlorosis and anemia, rheumatic affections, gout, obesity, neuralgias, colds, multiple sclerosis, tertiary syphilis, arthritis deformans, and neurasthenia have all been favorably influenced, partly through beneficial blood changes, and in part by heightened metabolism. Psoriasis and allied skin diseases have likewise benefited under the light-treatment. He says the treatment should, however, not be used alone, but in combination with general therapy.— *New York Medical Journal.*

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

Bacterial Transmutation.— At a recent meeting of the Société de Biologie, Paris, Dr. Caldas, a Brazilian bacteriologist, reported experiments on the colon bacillus of the rat. By cultivating the organism with a certain mold derived from rice, *aspergillus orizæ*, and passing it from rat to rat, he finally obtained a bacillus closely resembling the typical plague germ, in great numbers from the glands, spleen, stomach, and intestines of the infected animals, which produced, when injected into rats, similar clinical symptoms, and was always rapidly fatal. The biological characters of this organism throughout were the same as those of Kitasato's bacillus pestis, and he has no doubt as to their equivalence. He claims, moreover, to have succeeded in rendering a horse immune by venous injections of at first very diluted cultures of the germ, followed by more virulent ones, and with this horse's serum has been able to save rats that had previously been inoculated with the virulent cultures. He gives it as his opinion that the plague in its origin is a colon bacillosis of rats caused by the ingestion of rice containing a mold, *aspergillus orizæ*, and that the colon bacillus, by successive passages from rat to rat, takes on the characters of the plague bacillus.

Dr. Caldas's experiments do not appear as yet to have attracted much attention, but they are certainly suggestive. Our methods in the study of bacteria are not yet perfect, and their taxonomic distinctions are far from being yet fully established. It may be difficult or even impossible to determine fully all the specific characters of these minute organisms, but until we do, we can not be altogether positive as to their possible varieties and transformations. The identity of the Sanarelli bacillus of yellow fever is a case in point, and it may be mentioned in this connection also that Caldas claims this germ to be likewise a modification of the bacillus coli, the special virulence of which is due to the presence of a mold.— *Journal American Medical Association, Jan. 12, 1901.*

A Further Report on the Action of Moderate and Intense Cold on Bacteria.— Dr. Park, at the annual meeting of the New York Pathological Society, made this report. He said that the original report had been on the effect of cold on the typhoid bacilli in water. Twenty cultures had been frozen for varying lengths of time. On an average the cultures showed 42 per cent of the bacilli living for half a week; 14 per cent for one week; 7.5 per cent for two weeks; 0.4 per cent for three weeks; 0.1 per cent for five weeks; .09 per cent for seven weeks; .05 per cent for nine weeks; .005 per cent for twelve weeks; .002 per cent for fifteen weeks; .0001 per cent for eighteen weeks. At twenty-two weeks all of the bacilli in the twenty cultures were dead in the water. For the first three weeks all of the cultures were alive in the water. There was evidently quite a difference in the viability of the cultures. Experiments had also been made with the bacteria exposed to liquid air for different periods. At the end of three minutes, only 18 per cent of the typhoid bacilli were living; at the end of sixty minutes, only 7 per cent. The colon bacillus acted very similarly. The hay bacillus with spores showed 55 per cent living at the end of two hours. The streptococcus and the diphtheria bacillus were tested for virulence after two hours, and this was found to be unaltered. Motile bacteria were found to be but little excluded from water in the act of freezing.— *Medical Record.*

Typhoid Bacillus.— According to *Treatment* for December, Remy, in *Ann. de l'Inst. Past.*, describes a new medium for the isolation of the typhoid bacillus from the stools and from water: —

	Grams.
Distilled water	1,000
Asparagin	6
Oxalic acid	0.5
Lactic acid	0.15
Citric acid	0.15
Disodium phosphate	5
Magnesium sulphate	2.5
Potassium sulphate	1.25
Sodium chloride	2

He says that the special gelatin medium by the plate-culture method enables us to isolate the typhoid bacillus in the presence of the bacillus coli.

With this medium thirty-one experiments were made for the isolation of the typhoid bacillus from the stools of twenty-

three typhoid patients on different days of the disease. Three times the result was negative,—once upon the seventeenth day, once on the eleventh day, and once between the seventh and the eighth week; in the latter instance the typhoid bacilli had disappeared.

The number of typhoid bacilli in the stools increases up to the second week, and diminishes progressively during the third and fourth weeks.

The typhoid bacilli isolated from the stools always belong to one and the same type, and they do not give indol, do not ferment lactose, and are agglutinated by a high dilution of experimental serum.

The typhoid bacilli obtained from the stools during the course of the second week, as well as those isolated from the spleen post-mortem, possess a remarkable vital activity, forming good colonies within forty-eight hours, growing vigorously in broth, and even in mineral solutions.

The typhoid bacilli isolated from the stools at the end of the disease, on the contrary, possess but a feeble vital activity, the colonies on plates growing slowly.

In twelve cases of disease other than typhoid fever, the genuine typhoid bacilli could not be detected, although in two a bacillus was isolated which resembled the typhoid bacillus culturally, but which was not agglutinated by antityphoid serum.— *Charlotte Medical Journal, January, 1901.*

Concerning Pseudo-Tuberculosis Bacilli in the Sputum of Pulmonary Gangrene.— Dr. Ezio Benvenuti (*Gazzetta degli Ospedali e delle Cliniche*, Nov. 25, 1900) calls attention to the occurrence of a bacillus in the expectoration of pulmonary gangrene which resembles, both in structure and in staining qualities with the Ziehl-Nielssen method, the germ of tuberculosis. He reports briefly the history of a case in which pseudo-tuberculosis bacilli were found. The autopsy showed no tuberculous lesions, but a focus of pulmonary gangrene. Inoculation of animals with some of the exudate found in the gangrenous focus gave completely negative results, so far as tuberculosis was concerned. A bacillus resembling the germ of tuberculosis in almost all respects, except that it was more resistant to acids and alkalies, was found by Müller in *phleum pratense*, and in the feces of cows, goats, and other animals. A similar bacillus was found by Fraenkel and Rabinovitch in a case of pulmonary gangrene. Similar bacilli are also found in butter.— *New York Medical Journal, January, 1901.*

Morphological Variation in the Pathogenic Bacteria, with Two Pronounced Examples.— Dr. O. P. Ohlmacher (*J. A. M. A.*, Dec. 22, 1900) says that a member of the colon-bacillus group, recently obtained from the gall bladder, bile ducts, and viscera in a case of gangrenous cholecystitis and cholangeitis, furnishes the more striking of the two examples which he brings forth for consideration. The polymorphism of this organism, though evident in the pure cultures obtained from the kidney, spleen, and heart's blood, was particularly striking in the original smears and sections from the gall bladder and bile ducts, and in the first generation of cultures from these sources. All gradations, from minute coccoid or diplococcoid to long, coarse, filamentous forms, were observed in the smears and sections from the biliary apparatus. The coccus, diplococcus, and the short, streptococcus-like individuals corresponded precisely to those recently described by Adami, Abbott, and Nicholson, being often so small as to tax the amplification of the one-twelfth-inch objective.

The Multiplication of Bacteria.— According to the *Medical Dial*, a single bacterium has been calculated by Nageli to weigh one ten-thousand-millionth of a milligram. The length of a generation is from fifteen to forty minutes. Supposing all the conditions for multiplication to be favorable, the results are appalling. Cohn has estimated that a single germ can produce, by simple fission, two of its kind in an hour; in the second hour these would have multiplied to four; and in three days they would form a mass of four thousand seven hundred and seventy-two billions, an enormous mass, the weight of which would amount to seventy-five hundred tons. Fortunately, these ideal conditions never exist, each germ requires food, and as the supply is always limited (not to speak of other conditions), immense numbers die of starvation.

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THERAPEUTIC APPLICATIONS OF THE ELECTRIC-LIGHT BATH.

IN experiments conducted by the writer, assisted by his colleagues, Doctors Paulson and Rand, and Professor Gomberg, of the University of Michigan, who superintended the chemical work, several very useful and interesting facts respecting the physiological effects of the electric-light bath have been demonstrated. It was ascertained, for example, that this bath is without doubt the most efficient and satisfactory of all modes of producing perspiration, as it stimulates the perspiratory glands and other structures of the skin in the most powerful manner. It causes perspiration to appear in a remarkably short space of time, thus avoiding the exposure of the body to the exhausting effect of prolonged heat, as profuse perspiration generally appears in the electric-light bath in from three to five minutes, even when the temperature of the air surrounding the patient is not above 85° F., while the dry pack not infrequently fails to produce vigorous activity of the skin within less than an hour and a half or two hours, a still longer time being sometimes required.

A fact which must be kept in mind in the employment of this powerful means of calorification, however, is that the body temperature, as indicated in the rectum, may rise to 103° or even higher in a prolonged electric-light bath.

It has also been ascertained that the lungs throw off, while exposed to the incandescent light, a decidedly larger proportion of carbonic acid gas than usual, showing increased oxidation, hence the bath must not be excessively prolonged.

The peculiar value of the electric-light bath is due to its efficiency as a source of radiant energy. In the Turkish bath, heat is communicated to the body chiefly by convection from heated air. Air, being a poor conductor, communicates heat to the body very slowly. Absorption of heat is further hindered by the skin, which is an excellent nonconductor, and by the rapid evaporation of moisture upon the skin, whereby it is cooled so rapidly that it is possible for a person to enter and remain for a considerable time in an atmosphere far above the boiling point. The heat of the electric light is in the form of radiant energy. The electrical current of the incandescent electric-light bath develops light-rays to the extent of only five to eight per cent, while heat-rays are developed to the extent of ninety-two per cent.

This energy is not communicated to the body by convection. The skin, as well as the air, is to a large extent transparent to radiant heat, and the same is true of all the living tissues. This is evidenced by the gastrophone of Einhorn and other transilluminators. Through a speculum placed in the vagina with a suitably arranged electric light placed close to the abdomen, the writer has seen the interior of the trunk illuminated and made to glow with a bright red light, the red color being due to reflection from red corpuscles of the blood. Even the bones are translucent to light when in the living state. This is clearly shown by placing the hand between an electric light and the eye, with the fingers in close contact; if the hand is placed near enough to the light, the whole fingers will be seen illuminated, the bones as well as the soft parts. It may thus be said that the heat from the electric light penetrates the body just as it would penetrate any other transparent

or semitransparent medium; while the heat of the Turkish, vapor, or Russian bath is communicated to the body by convection, and slowly works its way into the body by heating the successive layers of living tissue, which, although, like glass, transparent to radiant energy, also possess to a greater or less degree the nonconducting quality of glass and allied substances.

Dr. Winternitz, professor of nervous diseases in the Royal University at Vienna, after having carefully reviewed the writer's observations concerning the electric-light bath, and having himself made an extended study of the bath, states his conclusions in a recent work as follows:—

"The electric-light bath presents an advantage over every other means of applying heat in the readiness with which the dosage may be regulated as regards time and intensity. The instant the switch controlling the circuit is closed, the whole force of the bath, or that portion of it in use, is brought to bear at once upon the body. The instant the circuit is opened the heat is wholly and absolutely withdrawn. By means of properly adjusted switches, whereby the number of lamps in use may be controlled, the amount of heat applied may be exactly regulated.

"Another advantage of the electric-light bath is that it does not interfere with heat elimination. It, in fact, encourages heat elimination by encouraging free perspiration. Many other forms of hot applications, particularly hot-water baths and sweating packs, cause retention of bodily heat. In the electric-light bath, the heat elimination and the excretion of effete matters which accompany vigorous perspiration proceed with increased activity at the same time the rays of radiant heat are penetrating the tissues, elevating the temperature of the blood, and quickening all the vital processes."

"The importance of this property of the electric-light bath is clearly shown by the interesting experiments of Conrad Klar. This investigator showed by calorimetric experiment that with the body exposed in an atmosphere somewhat below the body temperature, heat elimination was during the first five minutes ten times the normal amount, while during the second five minutes the amount of heat eliminated was half as great. The diminished loss during the second five minutes was doubtless due to contraction of the blood vessels of the skin. In the electric-light bath the cutaneous vessels are thoroughly relaxed, and this condition is maintained by the action of the rays of light falling upon the skin while the air about the patient is but little above the ordinary atmospheric temperature, a condition which in the highest degree favors heat elimination."

Professor Winternitz continues:—

"The electric-light bath is a new invention by Kellogg, Battle Creek, Mich., U. S. A. It is undoubtedly true that radiant heat penetrates the tissues much better than conducted heat, and it is very probable also that the inner life of the cell is influenced by the radiant heat, either qualitatively or quantitatively, and to a higher degree. All the effects of the vapor bath can be produced by the electric light bath. The loss of carbonic acid gas is considerably greater than in the vapor bath, and what is especially remarkable, perspiration occurs very quickly and at a very low temperature, and is very profuse. [Indications of perspiration are sometimes noticed at 28° R. (95° F.). The writer has observed perspiration at 85° F., and Professor Winternitz stated to him personally (1899) that he had seen moisture appear upon the skin in a single instance at 65° F. The patient was a somewhat excitable neurasthenic, and very susceptible to the stimulus of radiant energy.]

"Ordinarily a much higher temperature is necessary before symptoms of sweating occur in the vapor bath. The

time required to produce sweating in the electric-light bath is commonly three and one-half minutes, whereas about five minutes are required in the vapor bath. Finally, the quantity of perspiration is considerably greater in the electric-light bath. That the radiant heat is the main cause of this, and not the heated air, was evident from the observations made by us that the external part of the leg upon which the rays of light directly fell, perspired very much more quickly and profusely than the internal part of the leg, which received only reflected rays. After ten to thirty minutes the body temperature increased to 40° C. (104° F.), the pulse to 160, respiration to 42, symptoms of the condition resembling fever. We have used the electric-light bath in ways analogous to the use of the vapor bath in a number of cases of sclerosis, rheumatism, and gout, and have been much gratified with the results. We have as yet made no further experiments. Kellogg reports very good results in sclerosis, arthritis, and many disorders of nutrition. Lehmann has been very successful in psoriasis. Since we have in the electric-light bath a thermal method by which the degree of heat applied can be physiologically and exactly measured, and knowing the powerful influence of light upon the life of the cell and of the whole organism, we believe that this method will hold a prominent place among the forms of thermal applications, and that we shall be enabled by its use to influence a series of maladies more quickly, more effectively, and more satisfactorily than heretofore."

Therapeutic Applications.—The electric-light bath has proved in the writer's hands of far greater value in the treatment of a large variety of maladies than any other means of applying heat except water, and admits of much more general employment than the ordinary Turkish, Russian, vapor, or hot-air baths. One reason of this is the convenience and rapidity with which the degree of heat may be graduated by turning on or off one or more groups of lamps, the amount of heat being rendered absolutely and instantly controllable, since the source of heat relied upon is the incandescent filaments of the lamps rather than a heated atmosphere. The instant the lamp is turned off, the heat which had previously been emitted is withdrawn from operation. If additional heat is required, the desired number of lamps may be turned on, and become instantly operative.

Another reason for the more universal utility of the incandescent-light bath is the fact that when properly applied, its effects are highly tonic in character. A short application of the bath at full force for a time just sufficient to induce powerful stimulation of the skin without provoking perspiration is a most effective means of cutaneous stimulation. The tonic effects of such an application may be still further intensified by instantly following the bath with a cold spray or other cold application, thus producing a revulsive effect of the most agreeable and effective character. The excessive heating of the skin prepares the way for the cold application, without at the same time so overheating and relaxing the blood vessels as to render recovery of the tone of the cutaneous tissues so tardy as to involve the risk of exhausting the patient too greatly or exposing him to the liability of taking cold. In the experiments referred to, the amount of perspiration produced in the electric-light bath was found to be double that produced in the Turkish bath. The body temperature is also raised more rapidly in the electric-light bath than in any other form of bath, because the rays of radiant energy pass through the skin and reach the interior of the body.

The electric-light bath is especially valuable in cardiac disease and in diabetes, in which prolonged sweating measures can not be employed without more or less

risk. The penetrating nature of the heat of the electric-light bath stimulates oxidation of the residual tissues, and thus hastens the disappearance of the redundant fat in obesity. In dropsy associated with either cardiac or Bright's disease, in the toxemia of chronic dyspepsia, and in all conditions for which general and local applications of heat are applicable, the electric-light bath stands pre-eminent.

Chronic malarial cachexia, syphilis, diabetes, obesity, neuritis, neuralgia, acute nephritis, migraine, neurasthenia, tetany, habit chorea, and hysteria, yield good results to the thermic impressions of the electric ray.

In rheumatic and anemic patients, and in all cases when the heat-making capacity is small, the electric-light bath serves an exceedingly useful purpose in preparing the skin for cold applications by storing up in it supplies of heat; and it serves a useful purpose in this way, not only in preparing the patient for tonic applications of water, but as a means of producing most excellent revulsive effects. For pure revulsive effects, only the circulatory reaction is desired, it being, in fact, necessary to suppress thermic reaction altogether. Hence the duration of cold applications which follow hot applications should be such as exactly to neutralize the heat which has been absorbed by the skin in the previous hot application. The electric-light bath having the power to store up quickly a large amount of heat in the skin, it is consequently of special service in applications of this kind, which are the most effective means of relieving internal congestion, as well as the most powerful of all external agents for the relief of pain.

The electric-light bath is superior to all others in the treatment of chronic rheumatism and all maladies dependent upon the uric-acid diathesis, owing to its ability to elevate body temperature while at the same time producing vigorous cutaneous activity. The elevated temperature stimulates the oxidation of proteid wastes, and augments vital combustion, while the increased skin activity carries off the waste products prepared for elimination.

Recent physiological experiments have shown that the elevated temperature in febrile conditions is one of the methods by which nature combats the causes of disease, or neutralizes some of the morbid conditions resulting from disease. The physiological effects of the electric-light bath may exercise in many cases a strongly curative influence by the elevation of the body temperature, thereby enabling it to produce antitoxins or to render effective the curative efforts instituted by the *vis medicatrix naturæ* of the body.

As a prophylactic, this bath also possesses a high value, especially for persons who live a sedentary life, as teachers, doctors, lawyers, preachers, judges, and professional men generally, and to still greater degree for the majority of women, as it is the best substitute for muscular activity in the open air.

The hygienic value of the sweating bath is certainly scarcely yet appreciated by the majority of civilized men and women. This can not be said of the Finns, however; for in Finland every house has connected with it a bath-house with conveniences for producing vigorous perspiration. Indeed, the writer, while on a recent visit to Copenhagen, was told by an intelligent Finnish gentleman that it is the custom in his country for a young man anticipating matrimony to build as a foundation of his future home, first of all, a sweat-house. A vast multitude of city dwellers in civilized countries are suffering tortures from disease in various forms, and dying prematurely, because of the neglect of that important hygienic provision in the injunction of the Almighty to Adam, "In the sweat of thy face shalt thou eat bread." Indeed, the neglect to sweat is one of the most prolific causes of disease in the condi-

tions of civilized life. A modern writer has very sagaciously suggested that the chief difference between the savage and the civilized man is in the way he sweats. The savage sweats his brow in earning his bread, and taxes his brain but little; the civilized man earns his bread by the sweat of his brain, but seldom sweats his brow.

The electric-light bath, while not a complete substitute for the sweating produced by exercise, certainly comes nearer to being so than any other heating process; and when followed by some vigorous cold application, as the cold bath, possesses a hygienic value which can not be overestimated.

A local application of the electric light for fifteen or twenty minutes, followed by an application of an ice compress or ice friction for five to eight seconds, is almost a panacea for the pain of sciatica and for similar painful affections in which there is no inflammatory action.

The electric-light bath has been found superior to all other means for applying heat to circumscribed areas of the surface; and by the use of a number of simple appliances, it is far more convenient in its application than the fomentation, hot bags, or any similar appliance.

M. Below, who has for some time employed the electric-light bath constructed after the writer's plan, reported in a paper read before the Medical Society of Berlin in 1898, a considerable number of cases in which the bath has been successively used in the treatment of rheumatism, syphilis, and various other morbid conditions.

That the electric arc light acts powerfully upon the nervous system has been clearly proved by the experiments of Maklakow, Arloing, Paul Bert, and others. As yet, it is true, we are not fully acquainted with the exact measure of this influence; neither do we know precisely to what extent it may be utilized therapeutically; but knowing the fact, and having at hand the appliances necessary for exact observation, we are on the road to therapeutic discoveries which may prove to be not only interesting but of immense advantage to the human race.

That it is a true nerve tonic can not be doubted. It is daily in use in the treatment-rooms of the Battle Creek Sanitarium, and in the great hydriatic institution of Dr. Winternitz, at Kaltenleutgeben, near Vienna, and produces most excellent results, especially in the treatment of neurasthenics suffering from chronic toxemia.

Finsen, of Copenhagen, has shown that the actinic ray of the electric arc is capable of destroying the bacillus of tuberculosis in the skin under suitable conditions, and has utllized it in the successful treatment of hundreds of cases of lupus. On the occasion of a visit to the "Light Institute" at Copenhagen, an institution under supervision of Professor Finsen, the writer saw demonstrated most clearly the powerful therapeutic value of the actinic ray of the electric arc in the treatment of this disease. There were numerous cases nearly cured, photographs of which, taken when they entered the institution, showed that the disease had already attained an advanced stage, while the history showed that these cases had proved wholly intractable to other methods of treatment. At the time of the writer's visit, there were one hundred and twenty-five persons under treatment in the institute. A large number of these were personally seen, and the progress which had been made under treatment was remarkable. The writer is awaiting the opportunity to make a trial of this same method in the treatment of leprosy, believing that it may be found of value in dealing with this most obstinate malady, at least in the tubercular form of the disease.

HOT BATHS IN RHEUMATISM.

MORRIS has called attention to the interesting fact that when hot baths are employed, only half as much salicylic acid is required to obtain equal effects as when the baths are not employed. Morris employs the hot bath at a temperature of 100° to 105° every morning.

In the writer's experience the hot bath may be repeated two or three times a day. It is not necessary to employ the immersion bath. The hot-blanket pack is equally as effective as the immersion bath, and may be repeated every three or four hours, or often enough to keep the patient perspiring freely. In acute articular rheumatism, the amount of uric acid produced is increased to an enormous degree. Active perspiration is nature's method of eliminating this acid. The patient may drink large quantities of water and diluted lemonade; and other well-diluted fruit juices should be freely employed. The idea that fruit acids are likely to aggravate the disease is a popular notion that has been thoroughly exploded by modern investigation. Organic acids are converted into CO_2 by combustion, rendering the blood alkaline, and also increasing the alkalinity of the urine. This has been abundantly proved by numerous experimental investigations. By the use of salicylic acid combined with the hot bath, attacks of acute rheumatism may be abbreviated, but the hydriatic method alone suffices in most cases. The large doses of salicylic acid or salicylate of soda required to produce the desired effect when the hot bath is not used, are a great disadvantage to the patient, often producing serious gastric disturbances.

Dyspepsia from Imperfectly Cooked Cereals.—I am decidedly of the opinion that in fully one half of all the cases of dyspepsia which may be encountered in this country of dyspeptics, the digestive disorder is chiefly due to the use of imperfectly cooked cereal foods, such as oatmeal mush, cracked wheat, and the almost endless number of so-called breakfast foods or breakfast cereals. It is claimed that many of these are steam-cooked, and may be made ready for the table in from three to fifteen minutes. The fact is that almost without exception these foods require many hours' cooking at boiling temperature to effect even the first stage of the transformation of starch; whereas, real dextrinization requires exposure for a considerable length of time to a temperature 100° higher, or about 300°. Ordinary processes of kettle cooking are incapable of properly preparing cereal foods for prompt digestion and assimilation. This is a matter to which physicians must give serious attention in dealing with cases of indigestion.

PROGRESSIVE members of the medical profession will be glad to know that Prof. Joseph McFarland, M. D., the well-known bacteriologist and pathologist of Philadelphia, has recently passed, through the munificence of Messrs. Parke, Davis & Co., into a position to give his whole time to original research work.

There is no better way in which wealthy business firms and men of large means can benefit the general public than by placing in the hands of such men as Professor McFarland the means, facilities, and the opportunity for conducting scientific research, having for their object the amelioration of the sufferings of humankind and the saving of human life.

REVIEWS.

ANNUAL AND ANALYTICAL CYCLOPEDIA OF PRACTICAL MEDICINE.— By Charles E. de M. Sajous, M. D., and one hundred associate editors, assisted by corresponding editors, collaborators, and correspondents. Illustrated with chromo-lithographs, engravings, and maps. Volume VI 1901 F. A. Davis Company, publishers, Philadelphia New York, Chicago.

This, the sixth and last volume of this work, is in keeping with its predecessors in that it contains the latest valuable facts pertaining to that part of medicine and surgery of which it treats. Besides the general index, a study of which will give some idea of the magnitude of the subjects treated, it contains valuable articles from distinguished authorities, among which are the following: "Rheumatism," by Dr. Levison, of Copenhagen; "Diseases of the Stomach," by D. D. Stewart, of Philadelphia; "Surgery of the Stomach and Intestines," by Prof. W. W. Keen and Dr. M. B. Tinker, of Philadelphia; "Surgery of the Spine," by Prof. R. H. Sayre, of New York; "Syphilis," by Prof. G. F. Lydston, of Chicago; "Surgery of the Urinary System," by Prof. J. W. White and Dr. A. C. Wood, of Philadelphia; "Diseases of the Uterus," by Prof. E. E. Montgomery, of Philadelphia; "Wounds and Injuries of the Chest," by Prof. L. A. Stinson and Dr. E. L. Keyes, Jr., of New York; and "Yellow Fever," by Surgeon-General Wyman, of Washington.

The complete set is a library in itself, and forms a valuable addition to the physician's library.

DISEASES OF THE HEART; THEIR DIAGNOSIS AND TREATMENT.—By Albert Abrams, A. M., M. D., San Francisco, Consulting Physician for Diseases of the Chest, Mt. Zion Hospital and the French Hospital. Illustrated. Pages, 172. Price, $1.00 net.

In this handsome little volume the author discusses the subject of diseases of the heart entirely from a practical standpoint. His experience in the diagnosis and treatment of diseases of the heart has enabled him to condense in a practical and comprehensive manner the essentials of these subjects. The busy practitioner will readily find in this work the necessary facts pertaining to the subjects of which it treats.

The contents of the book are as follows: Introduction to Diseases of the Heart; Diagnosis of Diseases of the Heart; General Treatment of Diseases of the Heart; Affections of the Pericardium, Endocarditis, and Chronic Valvular Disease; Neuroses of the Heart; Affections of the Arteries; Addendum. In the chapter on Affections of the Arteries, the author describes and calls attention to Gaertner's tonometer, an instrument used for the purpose of gauging blood-pressure. With this instrument, arteriosclerosis may be recognized before palpable changes can be detected in the peripheral vessels.

The publishers of this book are to be congratulated on placing such a work within reach of the medical profession.

PAMPHLETS RECEIVED.—"Notes on Some Affections of the Heart Substance, with Illustrative Cases." Thomas E. Satterthwaite, M. D., New York City.

"Lupus Healed with Roentgen Rays: Report of a Case;" "The Treatment of Epitheliomas of the Skin, with Report of Cases." William Allen Pusey, A. M., M. D., Chicago.

"Aseptic Minor Gynecology, with Demonstrations." Augustin H. Goelet, M. D., Scranton, Pa.

"Treatment of Prostatic Hypertrophy." Parker Syms, M. D., New York City.

The Battle Creek Sanitarium

LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
NEWTON EVANS, M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR FEBRUARY.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
103 per cent.	4		4
100 " "	49	27	16
95 " "	29	8	37
93 " "	16	17	33
91 " "			
88 " "	13	9	22
85 " "	5	6	11
83 " "	2	4	6
78 " "	1	3	4
71 " "		7	7
Total	119	81	140

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	40	7	47
Between 4,500,000 and 5,000,000	50	11	61
" 4,000,000 " 4,500,000	25	36	61
" 3,500,000 " 4,000,000	10	9	19
" 3,000,000 " 3,500,000	3	4	7
" 2,500,000 " 3,000,000		2	2
Below 2,500,000			3
Total	128	72	200

Examination of Sputum.— There were 14 examinations made, 10 being new cases. Tubercle bacilli were found in 3 cases.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	20	54	7	41	23	45	50	47
Less than 10,000 bac.	17	46	10	59	20	34	47	45
Between 10,000 and 100,000 bac.					5	10	5	5
More than 100,000 bac.					3	6	3	3
Total	17	100	37	100	51	100	105	100

The patients were received from the following States and countries: Michigan, 21; Illinois, 13; Indiana, 10; California, 7; Georgia, 6; Wisconsin, 5; New York, 4; Tennessee, 4; Kentucky, 4; West Virginia, 4; Ohio, 3; Pennsylvania, 3; Minnesota, 3; South Dakota, 3; Ontario, 3; North Dakota, 2; New Jersey, 2; Missouri, 2; Nebraska, 1; Texas, 1; Iowa, 1; Kansas, 1; Manitoba, 1; N. W. T., 1. Total, 105.

Urinary Laboratory.— Total number of specimens examined, 517; number of new cases, 171; number of cases having pus, 69; albumin, 11; sugar, 4; casts, 1; blood, 2.

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MODERN MEDICINE

VOL. X. BATTLE CREEK, MICH., U. S. A., APRIL, 1901. NO. 4.

ORIGINAL ARTICLES.

LOCAL OR PARTIAL HYDRIATIC MEASURES.

BY J. H. KELLOGG, M. D.,
Superintendent of the Battle Creek (Mich.) Sanitarium.

(Concluded.)

The Liver and Spleen.— The arterial circulation of the liver and spleen may be influenced by the same measures described last month in relation to the stomach. The vessels of these organs are connected with the cutaneous circulation through the anastomosis of the phrenic arteries (left and right) with the internal mammary and the intercostals. Passive congestion of these organs is seldom of serious importance except when arising from disturbance of the portal circulation. Applications to relieve general portal congestion will relieve hepatic and splenic congestion, since such causes as tend to concentrate the blood in the portal circulation will influence in like manner the liver and spleen, together with other abdominal viscera.

The Intestines.— The intestines, especially the duodenum and the colon, have no vascular connection with the surface except through the renal circulation. Hot applications to the lumbar region, by lowering the pressure in the lumbar veins, may divert a portion of the blood from the left renal vein with which the veins from the duodenum and the transverse colon communicate. Similar applications over the front and lower portions of the chest exercise a like influence through the connection of the phrenic veins with the left renal vein on the one hand and the internal mammary on the other. Alternate applications may relieve the venous circulation of the duodenum and the colon through diversion of blood from the renal vein into the veins which accompany the branches of the renal artery distributed to the suprarenal capsule, the capsule of the kidney, and the overlying muscles.

The Portal Circulation.— The portal veins contain no valves. This makes it possible for this appendage of the venous system to render the most valuable service as a blood reservoir, the capacity of which may be very easily and quickly varied, thus constituting a regulating or balancing mechanism whereby the delicate structures of the body are saved from injuries which they might otherwise suffer from sudden or excessive increase or diminution of the blood pressure. There is maintained a constant balance between the intra-abdominal pressure and the general blood pressure. Even the volume of gases in the intestines and the tension of the abdominal muscles have an important relation to the blood pressure.

The influence of dermal applications upon the portal circulation depends to a large extent upon the reflex influence upon the portal vessels made by the sensory impressions through the vasomotor centers. The great splanchnic nerve is without doubt, through its control of the portal circulation, one of the most important factors in the blood-pressure-controlling mechanism of the body, but this function need not be here discussed, as we are now considering especially the methods by which the internal organs may be influenced by producing anemia or hyperemia in cutaneous areas which are related through direct or indirect vascular connections.

The study of the relations of the portal system to the general venous system and to the blood distribution of the skin, is exceedingly interesting, and of high practical value. The blood gathered up by the portal vein from the stomach, intestines, spleen, arteries, and gall-bladder, in the main finds its way back into the general venous system only after it has passed through a second capillary net-

work in the liver, from which it is gathered up, and conveyed to the ascending vena cava by the hepatic veins. There are, however, other channels well known to anatomists, of great practical value to the hydriatic practitioner. These are, as pointed out by Todd and Bowman many years ago, as follows: —

1. The hemorrhoidal plexus, which communicates with the mesenteric veins on the one hand and the internal iliac on the other, thus furnishing an outlet for the blood of the portal circulation at its most dependent part, —an important safeguard against the development of diseased conditions of the hemorrhoidal veins.

2. The esophageal veins, which connect the gastric veins and the vena azygos minor.

3. A direct connection between the left renal vein and the veins of the intestine, especially those of the duodenum and the colon.

4. A direct connection between the phrenic vein and the portal system at the surface of the liver (Kiernan).

These interesting anatomical relations, when understood by the hydriatic physician, place at his disposal most powerful means of influencing the portal circulation. Most important of all is the hemorrhoidal plexus, the largest and most direct communication which is readily accessible to hydriatic applications. This plexus may be influenced either by applications made directly to the rectum itself or to the cutaneous surfaces supplied by branches of the internal iliac. By warm or hot applications to the rectum the veins composing the hemorrhoidal plexus may be dilated, thus allowing a large amount of blood to pass through them, and relieving any abnormal pressure in the portal circulation, through the escape of a portion of the portal blood through the internal iliac. By hot applications (five to fifteen minutes) to the anal region, perineum, buttocks, or to the entire cutaneous area supplied by the internal iliac, as by means of a hot pelvic pack or a hot sitz bath, followed by a short cold application (thirty to sixty seconds), strong fluxion of the portal circulation may be produced, and passive congestion may be thus relieved.

Chronic portal congestion is best combated by the prolonged sitz and the wet girdle. The temperature of the sitz should be 80° to 70°, the duration fifteen to thirty minutes. The girdle should be protected by flannel only, and should be renewed every four hours, or just before it becomes dry, so that a tonic effect may be constantly maintained. These prolonged cold applications cause contraction of the external and internal branches of the iliac arteries, thus lessening the supply of blood to the iliac veins, and so lowering the pressure on the systemic side of the hemorrhoidal plexus, and increasing the outflow of blood from the portal veins. It is thus that the cool sitz affords relief in hemorrhoids, in catarrh of the rectum and colon, and in dysentery and diarrhea.

Cold applications either to the rectum itself or to the skin will temporarily produce the opposite effect; namely, interference with the movement of blood from the portal circulation into the systemic veins through the hemorrhoidal plexus. But if the application is short in duration, the reaction following may produce a result similar to that produced by warm or hot applications.

The effect of a prolonged hot application to the abdominal surface is quite different from that of a short application. The tone of the mesenteric vessels is constantly governed and modified by the reflexes sent in from the skin covering the abdomen. Cold causes contraction of the muscles of the intestinal walls as well as of the arteries, veins, and lymphatics, and even of the abdominal muscles; while heat produces the opposite effect. It is for this reason that we apply heat in colic and cold in tympanitis, acute inflammation, and hyperpepsia or hyperchlorhydria. A short hot application momentarily dilates the mesenteric vessels, but when it is removed, the subsequent cooling of the skin restores the normal tone. Thus passive portal congestion is relieved by short hot applications (five to ten minutes) followed by cold (one to two minutes), through the energetic fluxion induced. For marked therapeutic effects the application must be renewed at intervals of two to three hours. The compress may be alternated several times in succession at each application. When the application is prolonged, the mesenteric vessels lose their tone, and fill up with blood from the systemic circulation. It is thus that the prolonged (twenty to

sixty minutes) warm sitz or the continuous heating abdominal compress or the wet girdle produces not only hyperemia of the skin, but also filling of the portal vessels. When this effect is desired, the compress or girdle must be protected by an impervious covering so as to secure the maximum amount of heating effect. When flannel alone is employed, the wet compress gradually dries by evaporation, through which means a cooling effect is produced just sufficient to maintain the tone of the mesenteric vessels, thus producing intense hyperemia of the skin with accelerated movement of blood, but without overfilling the portal veins.

The means by which the portal circulation may be influenced through the communicating vessels, have already been described. The hot trunk pack (fifteen to twenty minutes), the sweating pack, the hot abdominal compress, the wet girdle covered with flannel only, the short hot sitz, and the Scotch douche to the spine and abdomen are the most effective means of draining the portal circulation through the cutaneous veins. A short cold application should always follow the hot application, to restore the tone of the visceral vessels.

The Upper Half of the Body.—Induced hyperemia of the legs diverts blood from the brain, chest, and pelvis, and by induced hyperemia of the arms, shoulders, and chest, congestion of the pelvic viscera may be lessened.

The Rationale of Localized Measures.—In the following paragraph the practical application of the foregoing principles is illustrated by means of the compress.

(1) Internal reaction, with dilatation of visceral vessels, occurs almost instantly after a short cold application, for the reason that the cause of the reflex vascular spasm (the cold application) being removed, the heat of the surrounding tissues (100° to 106°) quickly relaxes the parts. The rhythmical activity of the vessels of the part and the amplitude of their contractions are increased through the stimulation of the controlling ganglia. As a result, the supply of blood is increased, and with this arrive fresh and large supplies of oxygen, leucocytes, and nutrient material. There is also a more thorough removal of CO_2 and other waste products, and hence an increase in the normal vital activities of the part, a higher grade of life, better tissue-formation, and in time a restorative reconstruction in case the tissues of the organ concerned are in a morbid or diseased condition.

(2) The effect of a prolonged cold application is to cause continuous contraction of the vessels of the internally related part as long as cutaneous sensibility is maintained; but when the application is so intense or prolonged as to destroy the sensibility of the skin, the reflex action ceases, and stimulation of the vasomotor centers no longer exists, hence, the vessels of the related internal vascular area relax. Thus a cold application, if too prolonged or too intense, may defeat its own purpose, producing an effect the very opposite to that intended. This interesting fact seems to be little known, or at least little regarded, if one may judge from the loose way in which instructions are given for the use of cold applications to the skin for relief of internal congestions and inflammations.

The reflex stimulation of cold may be maintained by removing the application from three to five minutes every twenty to thirty minutes, the part being well rubbed with warm, dry flannel in the interim, or heat may be applied for two or three minutes.

The effect of a prolonged cold application, made in the manner suggested, is to lessen the blood supply of an internal viscus. This may sometimes be desirable, but is certainly far less often needed than is generally supposed. Injury does not result so much from the excess of blood in a part as from stagnation of blood. The blood is the chief healing agency in the body. It can not be too often reiterated—*it is the blood that heals.* Hence the aim should be to increase the supply of fresh blood to a part by encouraging the movement of blood through it, rather than to lessen the volume or the activity of the blood current.

While a cold application causes contraction of the vessels of the related viscus, the contraction of the cutaneous vessels may tend to fill the vessels of the part, if there exists collateral relation of the cutaneous and visceral vessels involved. The actual effect produced will depend upon the relative activity of the two forces. Care must be taken to arrange the compress in such a way as to avoid antagonistic effects of this sort. For example: In making cold applications to

relieve cerebral congestion, the cold application should include the neck, so as to cause contraction of the main supplying trunks, thus preventing the collateral hyperemia of the brain, which may be induced by cold applications to the face alone.

In certain cases the effect of cold applications may be to increase internal congestion to such a degree as to make this the dominant effect, thus constituting a contraindication. A good illustration of this is seen in the case of the eye. A cold compress contracts the supraorbital artery, thus increasing the blood supply of the eyeball to which a collateral branch is distributed. For this reason the fomentation rather than the cold compress is indicated in inflammation of the eyeball. But the application must not be so prolonged as to heat the eyeball itself, thus dilating the vessels. In most cases inflammation of the lids is better relieved by short, very hot applications than by prolonged cold compresses. If cold compresses are used, they should be very small, not larger than the eye socket, and care should be taken that they do not extend above the brow.

(3) The proximal cold compress controls local blood supply by contracting the supplying arterial trunk. This procedure is of special value in the treatment of congestion of the head, a cold compress, an ice-collar, or an ice-bag being applied to the neck. An ice-bag to the back of the neck contracts the vertebral arteries; cold applied to the sides or front contracts the carotids. The proximal compress is of greatest value when associated with heat applied derivatively, as in the treatment of cerebral congestion or inflammation, or inflammation of the pharynx, nasal cavity, or middle or internal ear.

(4) If the cold application is permitted to accumulate heat sufficiently to allow partial reaction to occur, being renewed only at intervals of ten to forty minutes, or when it has become warm, a still different effect is produced. At the first application of the cold, the blood vessels are made to contract, thus forcing out of the diseased organ the accumulated and poison-laden blood. The lymph vessels share in the constriction, and likewise the muscular elements of the capsule and other structures. Thus the organ is well squeezed, so to speak, as one might compress a wet sponge in the hand. The germ-laden leucocytes are sent on their way to the spleen or other parts for repair or destruction, while a new supply of these most valiant and important body-defenders is later brought into the part. As the compress warms up, internal as well as external reaction takes place, the vessels dilate, their rhythmical pumping is stimulated, and thus the introduction of a fresh and vital supply of blood is effected. By this means, leucocytosis is encouraged, and the supply of fresh leucocytes is constantly renewed, just as a wise general continually brings against the enemy fresh relays of soldiers, retiring those who are worn out by the combat, in order to maintain a vigorous fight.

From the foregoing it will be seen that the frequently renewed heating compress has characteristic properties which commend it for use in specific inflammations of deeply seated parts, as in pneumonia, typhoid fever, hepatitis, gastritis, pelvic and other internal inflammations.

It may be further remarked in relation to this form of partial application, that by permitting sufficient reaction to maintain an active cutaneous circulation, an excellent derivative effect is produced, the value of which is often overlooked.

(5) By alternate hot and cold applications to a limited cutaneous area, a most active fluxion of blood through an associated internal part may be produced; and this effect may be many times repeated, by reason of the constant renewal of the sensibility of the skin surface by hot applications, thus maintaining a high degree of reflex activity. The frequent change from heat to cold (every fifteen seconds) powerfully excites the nerve centers in charge of the parts, and thus the nerve supply; hence, this form of application is contraindicated by pain or acute inflammation.

Each application of cold causes instant contraction of the associated visceral vessels; each application of heat instantly restores the normal temperature of the skin, and terminates the reflex effect of the cold. Thus the organ is alternately emptied and filled, much as a sponge may be squeezed and filled, and this may be accomplished almost as rapidly as the compresses can be applied, and may be continued indefinitely,—a veritable pumping process by which blood may be passed through any internal organ,—a genuine

vasomotor gymnastics, applicable to a multitude of acute and chronic conditions.

On the other hand, an application so capable of exciting both vascular and nervous activity is especially adapted to cases of passive congestion, chronic exudates, and atonic and indolent states, such as malarial enlargement of the liver and spleen, rheumatic joints, serous and fibrinous exudates in the chest, muscles, or joints.

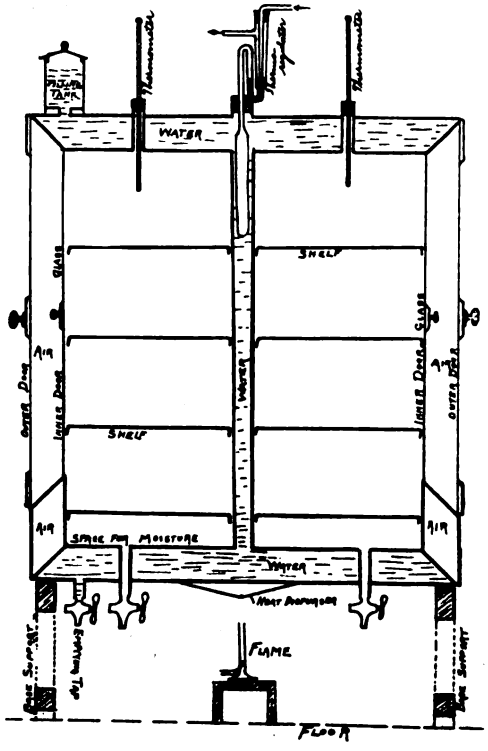
(6) Very hot applications produce internal vascular effects somewhat similar to those of cold applications; but the contraction is briefer in duration, and occurs only when the application is sufficiently hot to cause pain, and to induce contraction of the cutaneous vessels. The contraction of the cutaneous vessels quickly gives way to dilatation, especially of the veins, because of the direct influence of the heat upon the sympathetic ganglia of the small vessels; but the stimulation of the vasomotor center continues as long as the temperature of the application is sufficiently high to excite pain, and thus the influence upon the reflexly related parts may be much more prolonged. It must be remembered, moreover, that the application of heat to large surfaces, or over the heart, has the effect to excite the action of the heart, which is usually undesirable. The arterial trunks are also dilated, an effect often desirable and indicated, but which must sometimes be avoided. Hot applications for purely local effects should not be larger than necessary, and the duration must be carefully regulated.

(7) A warm or neutral compress is soothing in its effects. This fact is due to the shutting off from the internal related viscus of all external stimuli. It is by these stimuli, chiefly thermic in character, that the vascular tone and functional activity of internal parts is maintained. These vital conditions are, at least in very great measure, dependent upon the fusillade of sensory impressions constantly playing upon the spinal and cerebral centers. When these impressions become too intense, or the nerve centers abnormally sensitive, the phenomena of irritation appear — pain, spasm, hyperesthesia, etc. Neutral applications protect the skin against external irritants. This explains the soothing effect of the poultice. It must be remembered, however, that a warm compress, when applied across an arterial trunk, has the effect to dilate the vessel, and thus to increase the volume of blood flowing into the parts supplied by it. Hence the fullness in the head and the discomfort resulting from too warm clothing of the neck.

(8) Moderately hot applications generally produce congestion of the associated vascular areas. It is in this way that a warm hip or foot bath encourages the menstrual flow, and the heating of the abdominal compress fills the portal circulation with blood, and thus relieves the brain. The fomentation and the heating compress are the most important partial measures for accumulating or concentrating blood in parts in which such an effect is desirable either to combat a local anemia or to produce a derivative effect in favor of some remote or associated part, though many other procedures are of great service in special cases.

(9) By means of the prolonged heating compress it is possible permanently to increase the volume of blood in a part, thus lessening the volume of blood in some collaterally related area. For example, the prolonged heating abdominal compress not only distends the cutaneous vessels, but also the portal circulation, thus drawing away from the brain or lungs a considerable amount of blood, and relieving an existing congestion, either active or passive. (*a*) When the effect desired is increased volume of blood in a given part, for the purpose of producing anemia in some proximate or remote part, the wet towel should be protected not only by flannel, but also by rubber cloth or other impervious material. The purpose is to retain as much heat as possible, so as to secure the fullest dilatation of the cutaneous vessels. (*b*) When it is desired to increase the movement of blood in a reflexly related part, while at the same time combating stagnation or passive congestion, a compress covered only with flannel should be employed, so that by the limited but constant evaporation taking place, there may be maintained an active congestion of the skin and related parts, with derivative effect, and at the same time a vigorous fluxion in the reflexly related viscus, and a stimulation or energizing of the nerve supply of the part and of all those vital activities whereby disease processes are opposed and the integrity of the body conserved.

(10) The hot and cold compress produces remarkable effects by combining derivative and reflex effects. For example (*a*): A fomentation to the upper back diverts blood from the bronchial vessels, while cold simultaneously applied to the front of the chest contracts the same vessels by reflex influence, thus intensifying the effect; (*b*) Cold over the sternum with a fomentation over the lumbar region relieves congestion of the kidneys in the



same way, by diverting blood into the cutaneous branches of the lumbar arteries while contracting the renal vessels; (*c*) The pelvic circulation is controlled by a cold bag over the hypogastrium in conjunction with a hot pelvic pack; (*d*) To relieve congestion of the liver, stomach, spleen, or pancreas, the application may be reversed, the heat being applied to the anterior surface and the cold application behind; or if pain is not present, the compress may be applied to the whole trunk, thus acting derivatively upon the whole portal system, while an ice-bag is placed over the stomach to contract the gastric vessels, and thus combat congestion, which is likely to be the cause of the pain; or for distension of the stomach with gas, a frequent accompaniment of hyperpepsia or hyperchlorhydria, which depends upon the escape of gas from the blood rather than upon fermentation; (*e*) The intestines are most strongly influenced by the cold compress to the umbilical region combined with the fomentation over the lumbar region.

(11) The hot and cold pack consists in a hot bag or coil combined with a heating compress or partial pack. The action differs from that of the hot and cold compress in that the principal action is a remarkable derivative effect through drainage of the veins of the affected part by the passive hyperemia induced by the heating compress, while at the same time blood is diverted from the arteries by the dilatation of the collaterally related vessels by means of the hot bag.

The hot and cold pack very strongly influences both the arteries and the veins. It is, perhaps, our most powerful derivative procedure, its effects being almost wholly derivative in character, while the hot and cold compress concerns chiefly the arteries, which it influences both reflexly and derivatively.

A NEW FORM OF INCUBATOR.

BY FRANK J. OTIS, M. D.,
Director of the Laboratory of Hygiene of the Battle Creek (Mich.) Sanitarium.

THE incubator is such a permanent and indispensable piece of laboratory equipment that it has assumed a definite form and plan of construction. For the smaller incubators there is no need for any change. When one contemplates the construction of a larger one, however, the difficulties become quite numerous.

In planning an incubator of large capacity, the writer found it necessary to depart from the customary form of construction, in order to gain several points in simplicity and ease of construction.

A year's service of the incubator has proved it to be so satisfactory that I take pleasure in describing it for those who may be interested. After sketching the plans for a rectangular incubator of large size, I saw that the lateral pressure of the water in the bottom would be 250 pounds to the square foot. Not only is the tying of the walls together by strips of metal

a tedious undertaking, but it is exceedingly difficult to make it sufficiently strong to stand the strain. Corrugated copper would assist in meeting the difficulty, but the material is expensive. So the rectangular form was abandoned and the circular used instead. Using a light weight of galvanized iron, the incubator was constructed without any lateral supporting of the walls whatever. A large cylinder was first made, then two tubs of sufficient size to go inside, bottom to bottom, allowing a three and one-half-inch space between them and the large cylinder, and a two-inch space between the bottoms of the tubs. The depth of the tubs was sufficient so that when their edges were united with the edges of the cylinder, it gave a beveled edge.

The incubator is forty-seven inches in diameter, and forty-two inches in length. There are two compartments, one opening at each end. Each compartment is forty inches in diameter and seventeen inches deep, and contains seventeen square feet of shelving space, or thirty-four square feet for the entire incubator. Each compartment contains a thermometer. There is also a little space below the lower shelf, which can be filled with water, making the entire incubator a moist chamber. By means of a draining tap the water may be removed at pleasure. The incubator itself contains a filling tank, an emptying tap, and a water gauge. The water gauge does not seem to be necessary, for a glass tube passing through the cork with the thermo-regulator will permit the water to rise in it to the same height that it does in the filling tank.

Placing the cylindrical incubator on its side, and applying the heat just beneath the central water space between the two compartments, an excellent circulation of water is secured.

The illustration above and the one on the opposite page show the detail construction more fully. The photograph, made by our illustrating and photo-micrographic department, represents an end view with the outer doors thrown open, while the inner glass doors are still closed.

From the foregoing, the readiness with which an incubator can be improvised becomes very apparent. Two cans of different size could be placed one inside the other, the edges soldered together. A lid could be made for the inner can and also a lid for the outer. Then with the heat applied to one side, and an opening in the other for a thermometer and a thermo-regulator, one would be prepared to grow bacteria without much difficulty.

HYDRIATIC MEASURES IN THE TREATMENT OF DIARRHEA: REPORT OF A CASE.

BY CHARLES E. STEWART, M. D.,
Battle Creek, Mich., Sanitarium.

THE patient, J. W. S., male, aged forty-nine, applied for treatment March 1, 1901. He stated that he had just returned from the South, and that ten days previously to his arrival he began to suffer from diarrhea, having a dozen or more passages daily. His appetite was poor, and he was feeling very weak, having lost several pounds in weight. The stools were dark green in color, watery in consistency, and had a very offensive odor. No particles of undigested food could be detected. The treatment was as follows: —

March 1. Cleansing enema consisting of two quarts of water at a temperature of 108° F. After the bowel was thoroughly cleansed, a second injection, consisting of one pint of a five-per-cent solution of hydrozone was injected high into the bowel through a bowel catheter, and was retained fifteen minutes. The

patient was also given fomentations to the abdomen. His diet consisted of gluten gruel and the juice of fresh fruits, principally orange.

March 2. The patient stated that he felt much better, had had only one passage during the previous twenty-four hours, and had slept nine hours. For several days prior to this time he had slept only from two to four hours each night. On this date his treatment consisted of a cleansing enema at a temperature of 108° F., followed by another consisting of one pint of a two-per-cent solution of sodium salicylate, injected high into the bowel and retained fifteen minutes. This was followed by a hydro-electric bath, Swedish shampoo, and spray.

March 3. The patient reported that he had secured his usual amount of sleep, that his appetite was good, and he was feeling much stronger. During the past twenty-four hours he had had one natural movement of the bowels, and the stool was well formed. His treatment consisted of a cleansing enema of the same temperature as the previous ones, fomentations to the abdomen, cold mitten friction, and massage.

March 4. The patient said that he felt as well as he did before the onset of the diarrhea. Nothing was passed from the bowel during the past twenty-four hours, except what was passed during the enema. He was allowed a more liberal dietary, consisting of well-dextrinized cereals, such as granose, grānut, and zwieback; nut foods, such as protose, malted nuts, and bromose; and a liberal allowance of fruits. The enemas were discontinued, and a week's tonic treatment begun, consisting of a hydro-electric bath, Swedish shampoo, and revulsive douche to spine and legs; fomentations to spine, cold mitten friction, and light massage; electric-light bath, Swedish shampoo, and revulsive douche to spine and legs; fomentations to the stomach and bowels, salt glow, and spray. After ten days of such treatment, the patient felt "like a new man."

Gout.—In the *Medical Record* for January 25, Alexander Haig discusses the causation, prevention, and treatment of gout. Regarding causation he says:—

Gout is due to poisoning by flesh and tea and similar substances, which introduce uric acid into the body in very considerable quantities.

The uric acid so introduced may not only remain in the body, but may prevent the excretion of the uric acid formed in the body.

As a result the body becomes more or less saturated with uric acid, which may irritate its fibrous tissues (gout or rheumatism) or may obstruct its capillaries, causing high blood pressure and defective capillary circulation and their results, such as the great group of circulation diseases, the uric acid headache, epilepsy, and mental disease, anemia, Bright's disease, Raynaud's diseases, etc., all of them being mere results of the enormous influence which uric acid exerts on the circulation of the body by obstructing its capillaries.

All diseases, which have been called by so many names, fall into two groups: (*a*) The local group, and (*b*) the circulation group; of which the latter is by far the more extensive and important, so that what we used to call gout and rheumatism become almost insignificant by comparison.

In the prevention and treatment we have only two things to do: To cut off the poisons that have been the cause of the trouble, so that introduction shall as far as possible cease; to provide for the elimination of the poison already in the body.—*Charlotte Medical Journal.*

Insanity from Constipation.— Roberts reports in the *Medical Brief* a case in which a woman having the symptoms of dementia, with distrust of relatives, delusion of poverty, intense restlessness and mutterings, was cured by the removal of an enormous mass of hardened feces from the rectum. Ulceration had taken place, producing recto-vaginal fistula. The patient had completely recovered within forty-eight hours after the removal of the mass.

The Frequency of Gall Stones.— According to Kehr, gall stones are found present in ten per cent of all (adult) autopsies, and give rise to no symptoms in about ninety-five per cent of cases in which they are present.

TRANSLATIONS AND ABSTRACTS.

[The articles in this department are prepared expressly for this journal.]

SUMMARY OF FACTS RELATING TO ANESTHESIA AND ANESTHETICS.

THE following excellent summary of the opinions of American and European authorities respecting the use and effects of chloroform and ether has been compiled by Dr. Ernest J. Mellish (*Medicine*, November and December, 1899):—

1. Chloroform almost invariably kills by its effects primarily upon the circulatory system, and ether by its effect primarily upon the respiratory system. There probably are exceptions to both these rules; consequently, hair-splitting discussions on this point are nonpractical and useless.

2. In anemia of the medulla the patient should be placed in the head-down position.

In sudden paralytic dilatation of the right heart, as after several deep inhalations of chloroform, the heart should be rhythmically compressed by squeezing the chest; or the patient placed temporarily in the feet-down position to empty the heart, artificial respiration being constantly maintained.

3. Anesthetics act directly or indirectly upon all the tissues, interfering profoundly with metabolism; and they tend to produce degenerate changes in the tissues, especially of the vital organs. Of the anesthetics in general use, chloroform is probably most dangerous in this respect.

4. Deductions based upon laboratory experiments are apt to be deceptive, and should be accepted with the greatest caution as applicable to sick human beings, unless they agree with conclusions based upon clinical investigations.

5. As a rule, ether produces less circulatory depression than chloroform. It causes dilatation of arterioles and increased capillary circulation, thereby insuring a good blood supply to the circulatory and respiratory centers and to the heart muscle; consequently these systems are in less immediate danger than with chloroform.

6. Cocainizing the nasal mucous membrane to antidote certain bad effects of anesthetics is not commendable practice.

7. On account of the reduction of body heat by anesthetics, they should be administered in a warm room, and the patient should be protected from loss of heat as far as practicable by proper covering of the body, by application of artificial heat, and by protection from dampness of skin. An excessively high room-temperature will do harm by adding heat depression to anesthetic- and operation-shock.

8. Ether, when properly administered, is no more liable to produce nephritis than is chloroform, perhaps not so much so. The changes produced in the kidneys by ether are as a rule temporary, while those caused by chloroform are apt to be more persistent.

9. Most of the pronouncedly dangerous effects of ether, and to a less extent of chloroform, upon the kidneys are due to poor preparation of the patient, faulty administration, bad after-treatment, or all of these combined.

10. Post-anesthetic nausea is best prevented by preparation and after-treatment which favor normal physiological tonus, with especial reference to the emunctories. Gastric lavage at the termination of anesthesia, followed by vinegar inhalation, will, in the great majority of cases, prevent serious disturbance from nausea.

11. The danger from hemorrhage is no greater with ether than with chloroform, perhaps not so great, since the bleeding which occurs from the effects of ether is primary, and is more certainly provided against, while the circulatory depression and vasomotor constriction due to chloroform, to a great extent prevent primary bleeding, and lead indirectly to later hemorrhage.

12. The safety margin between sufficient chloroform for anesthesia and the lethal dose is much narrower than it is with ether.

13. Patients should be well fed with easily digested and nonbulky food to within a few hours preceding anesthetization, and should be allowed water to within two or three hours of it. If this plan is followed, shock will be less, and elimination of the anesthetic will be more rapid, and with less harm to the emunctory organs. For the same reasons water should be given as liberally as practicable after anesthesia.

14. Machine methods in selecting anesthetics should be avoided as far as prac-

ticable, the anesthetic being selected according to the conditions present in the individual case.

15. Any anesthetic, especially ether, should be given with the greatest caution in the presence of special susceptibility to acute bronchial or pulmonary affections.

16. Further clinical investigation in the use of nitrous oxide is desirable and necessary in order to establish its status in relation to surgery; but its general employment is not practicable.

17. The majority of inhalers on the market are bad. An inhaler made on the principle of the Esmarch chloroform mask is the cleanest, safest, and best for ether as well as for chloroform. However, the "open method" of administering ether is not practicable in the tropics, in high altitudes, nor in open-air military surgery, on account of too rapid diffusion.

18. The ordinary tongue forceps is a barbarous instrument, and is often positively dangerous from forcing the base of the tongue against the pharynx.

19. The post of anesthetist is second only in importance to that of the operator, and the selection of an anesthetist should be made with great caution where possible.

20. *No person who has not a wholesome fear of anesthetics can be trusted to administer them.* Beware of one who believes any anesthetic to be perfectly safe.

21. The anesthetist should gain the complete confidence of the patient as to his ability and carefulness, so that the mind will be at rest on these points.

22. Patients who greatly fear anesthesia are the ones likely to give the most trouble to the anesthetist.

23. Other things being equal, the intelligent and educated take anesthetics better than those of low intellect.

24. The patient should be kept as free as possible from unnecessary noise and other disturbances during the induction of anesthesia.

25. The pupillary reflexes constitute the best guide to the presence or absence of surgical anesthesia.

26. The anesthetist should watch carefully the pupils, pulse, respiration, and the color and condition of the skin, depending upon no single symptom as a danger-signal.

27. The patient should be carefully watched from the beginning of the anesthesia until fully restored to consciousness.

28. When anesthetics are properly administered, patients seldom struggle.

29. Noisy breathing during anesthesia should be the exception, as it generally means faulty administration.

30. The minimum amount of anesthetic should be given consistent with the production and maintenance of the desired degree of anesthesia.

31. Compression of the phrenic nerve will, if properly done, usually control retching and kindred symptoms occurring during anesthesia.

32. The use of drugs preceding and during anesthesia should be avoided save where positively indicated, and if resorted to they should be used with the greatest care. It is best to depend almost wholly upon other means for the prevention of syncope or to resuscitate.

33. Anesthetic mixtures are in general less safe than the "straight goods." One can not know the relative proportion of the different components that the patient actually inhales.

34. Partial or "talking" anesthesia is advisable in some cases, but should be avoided in delicate or sensitive patients, especially for prolonged operations, unless taken quietly and with apparent abolishment of pain-sense.

35. Finally, the subject of anesthesia and anesthetics should be thoroughly treated in medical colleges, and each student required to conduct a number of anesthesias under the supervision of an expert.

Uric Acid Lesions.— Deficient oxygenation and excessive nuclein-catabolism, according to Croftan (*Medical Council*, January), produce a growth of toxic leucomains called the alloxuric bases, which are the true poisons in uratic lesions. Uric acid acts pathogenically only from its tendency to form concretions; the alloxuric bases entering the blood-current prepare a nidus for the deposit of these concretions, which in their turn act as mechanical irritants in the different tissues, in the joints, as in gout, and in the kidneys. The indications for treatment are: (1) To raise oxygenation, which can be done by oxygen inhalations, together with hygienic measures, such as massage, hydrotherapy, electricity, regulated diet, etc. (2) To regulate nuclein-catabolism

and this is chiefly done through regulation of the diet, in excluding foods which contain nuclein or alloxuric bases. Thus internal organs, such as the spleen, liver, sweetbread, kidney, brain, etc., are forbidden. Soups, meat extracts, and broths are unadvisable. Raw, dried, cured, and smoked meats are to be condemned; boiled, fried, and stewed meats are permissible. The starches, sugars, and fats are harmless as long as they do not disturb the digestion. Alcohol is absolutely harmful. Tea, because of some of its alkaloids, is forbidden. Water is beneficial. (3) The elimination of alloxuric bases and soluble urates, and, on account of the very irritating action on the kidneys, Croftan prefers to avoid diuretics and promote sweating by hot baths, massage, and friction-treatment. The salicylates, being diaphoretics, are also useful in this way. The alkalies act similarly and also neutralize lactic acid. The so-called specifics, guaiacum, colchicum potassium iodide, etc., are uncertain in their action, and he does not use them. (4) This indication is the removal of uratic secretions. The so-called solvent action of certain agents is altogether fictitious. The theoretic remedies used in these cases are not yet established. The best treatment of the mechanical condition is necessarily mechanical. He employs counterirritation, heat, and cataphoresis for this purpose. Cantharidal collodion painted over the inflamed point often relieves pain and lessens irritation, and heat can be applied with a simple apparatus made with a stovepipe and a lamp as well as with the more expensive ovens so generally advertised. Cataphoresis is indicated in chronic cases of gout with old deposits. The fingers and knuckles, being elaborately cleaned, and wrapped with borated absorbent cotton moistened with a solution of iodide of lithium, are placed on a metal plate connected with the negative pole. Above the fingers is placed a metallic electrode of the galvanic battery connected with the positive pole. About twenty milliampères, for ten minutes, are sufficient, massage of the joints following. As the uratic diathesis is a hereditary condition, its cure in one generation is not to be expected. We are limited to an intelligent prophylaxis, carefully regulated mode of life, and treatment of special manifestations. In this way the perversion may possibly be educated back to the normal.—*Journal of the American Medical Association, February, 1901.*

Dr. Germain See on Exercise.—This eminent French physician recently summarized in "La Gymnastique Française," the following excellent rules relating to exercise, the translation of which we quote from the *American Physical Education Review:*—

"Football is a dangerous exercise without value. Lawn tennis is an innocent game. Foot races are of moderate value. Races with burdens merit thorough disapproval. Bicycling is a very remarkable exercise, but racing should not be encouraged, since serious consequences to the heart and to those forces actively called into play are to be feared. Instead of popularizing these contests, therefore, we should restrain and prevent them.

"Active and passive gymnastics ought to be encouraged in so far as they facilitate respiration and help the muscular system.

"Fencing deserves the heartiest approval, as it develops the strength."

He apportions exercise appropriate for the various ages, sexes, individual constitutions, etc., as follows:—

"(*a*) For children up to twelve years of age, I prescribe very easy sports without effort, as lawn tennis. I permit quick walking, but not racing. I prohibit bicycling. If one goes beyond these prescriptions, the heart is dilated and weakened.

"(*b*) For adolescents from twelve to sixteen or eighteen years, bicycling and rowing are excellent. Fencing should be moderate and horseback riding insignificant in amount.

"(*c*) For adults eighteen to thirty-five or forty years of age, with a tendency to obesity or with large, inflated, gaseous stomachs, bicycling is desirable since it decreases the bodily weight without diminishing the strength. For a large stomach it is useful, though not always efficacious.

"(*d*) For fleshy adults with thickening of the heart: The moment the heart is attacked and becomes fatty, bicycling is bad. Walking up an incline is preferable; and if at the same time one decreases the amount of food and drink

taken, and abstains from alcohol in all its forms, this form of exercise may prove very efficacious.

"(*e*) For affections of the heart: No one should be permitted a bicycle unless a careful examination of the heart has been made. I have seen, as I have shown at length in my book, "Sur le Traitement Physiologue du Cœur," the most grave accidents result in the case of those who have the least lesion of the heart. For them, bicycling should be absolutely prohibited.

"(*f*) For persons with diseased lungs: Asthmatic patients may bicycle to advantage if the heart is sound, but consumptives can not. In any case the patient should not be allowed to bend over.

"(*g*) For persons with nervous disorders: Bicycling and hydrotherapy are very useful.

"(*h*) For persons with feminine weaknesses: In the case of women in general, and of young girls with chlorosis or anemia, bicycling is exceedingly injurious. Fleshy women may bicycle if they have no disease of the heart, blood, or feminine organs."

The Pathogeny of Gout.— Sir Dyce Duckworth, M. D., LL. D., London, gives his conclusions concerning the pathogeny of gout as follows:—

1. Gout as a morbid condition depends on an inherent vice of nutrition, which is manifested by an imperfect metabolism in various organs or parts of the body, presumably in the kidneys, and probably in the liver.

2. This trophic disorder or inadequacy (ralentissement de nutrition) leads to the formation of uric acid, probably in excess, and to the periodic retention of it in the blood (gouty uricemia).

3. Histology throws no light upon the intimate nature of this defect which thus relates to cellular potentiality, possibly under neuro-trophic influence, and not, so far as we know, to structural alteration.

4. This textural disability, or a tendency to it, may be primarily acquired, and also transmitted as a fault, thereby inducing from time to time uricemia with gouty manifestations in the descendants.

5. In most instances, under conditions which provoke it, and in some cases independently of these, attacks of gout may grow and come to a crisis. Such crises are attended by an alteration in the solubility of the uratic salt in the blood, whereby irritating crystals of biurate of sodium are produced, and precipitated in various parts of the body.

6. A paroxysm of gout, the sites of its occurrence, and its metastases are determined by nervous influences, probably dominated from the bulbar center, and the local attacks alight either in the joints, or in textures which have been weakened or rendered vulnerable by impaired nutrition, owing to past injury or overuse.

7. This central neurosis is an essential and transmissible feature in the pathogeny of gout, and pertains to the arthritic diathesis generally.

8. The uricemia of gout is peculiar, and unlike that which is induced by other morbid conditions, but the occurrence of uricemia in the gouty is by itself inadequate to induce attacks of gout.

9. Uratic deposits in any part of the body may be removed in course of time, but are apt to be permanent in the least vascular tissues.

10. Uratic deposits may occur to an enormous extent in gouty persons without the occurrence of any pain or paroxysms.

11. The clinical features of gout indicate that both hemic changes (dué to inherent morbid tissue metabolism) and a neuro-trophic disturbance act as pathogenic factors, and, consequently, gout is to be regarded as a neuro-humoral malady.— *Buffalo Medical Journal, October, 1900.*

An Experimental Study of Oxaluria, with Special Reference to its Fermentative Origin.—From a series of experiments upon lower animals, and from a careful study of the subject, H. Baldwin (*Journal of Experimental Medicine*) concludes as follows:—

1. As various amounts of calcium oxalate may be held in solution in the urine, conclusions based upon the presence or number of calcium oxalate crystals found therein are of no real value as an indication of the quantity of oxalic acid present.

2. Unless the utmost care is exercised, the results obtained by quantitative estimation of oxalic acid are subject to large percentages of error. This is especially true in the use of Neubauer's or Schult-

sen's methods, in which the calcium oxalate is precipitated in an alkaline solution.

3. An ordinary mixed diet regularly contains traces of oxalic acid or its salts.

4. A portion of the oxalic acid ingested with the food may be absorbed, and reappear unchanged in the urine.

5. The normal daily excretion of oxalic acid in the urine fluctuates with the amount taken in the food, and varies from a few milligrammes to two or three centigrammes, being usually below ten milligrammes.

6. In health no oxalic acid, or only a trace, is formed in the body, but that present in the urine has been ingested with the food.

7. In certain clinical disturbances which in some cases were associated with absence of free hydrochloric acid from the gastric juice, oxalic acid is formed in the organism.

8. This formation in the organism is connected with fermentative activity in the alimentary canal.

(*a*) The prolonged feeding of dogs with excessive quantities of glucose, together with meat, leads eventually to a state of oxaluria.

(*b*) This experimental oxaluria is associated with a mucous gastritis, and with absence of free hydrochloric acid in the gastric contents.

(*c*) The oxaluria and the accompanying gastritis are referable to fermentation induced by the excessive feeding with sugar.

(*d*) The experimental gastritis from fermentation is associated with the formation of oxalic acid in the gastric contents.

9. The symptoms attributed to an oxalic acid diathesis, with the exception of those due to local irritation in the genito-urinary tract, do not appear to be due to the presence in the system of soluble oxalates, but are more likely to depend on other products of fermentation and putrefaction.

Koch's Report on Malaria.—Koch (*Deut. Med. Woch.*, Dec. 6 and 13, 1900) summarizes the results accomplished by his malaria expedition. He reiterates that the examination of children is the best means of determining the presence and character of malarial infection in a place. In the peculiarly isolated aboriginal villages he visited in eastern Africa, he found it almost universal among the small children. A certain proportion succumb, but the remainder as they grow up seem to acquire a natural immunity by the fifth to the tenth year, and after that age develop into remarkably fine physique and health, even in the most intensely malarial localities. The children are never treated for malaria; quinine is never given them, and consequently the immunity attained can not be compared with other regions where the natural course of the disease and the process of immunization are interfered with by medicinal measures. He found that some of the islands of the Bismarck Archipelago were entirely free from malaria, while others had only one or all three forms. The immunity acquired in an island where only the quartan variety prevailed, for instance, did not protect against the tertian or tropical fever, or *vice versa*. He is convinced that man and mosquitoes are the only hosts of the parasites, and that by curing the infected children and all, even the deceptive latent cases in adults, malaria can be exterminated. He recommends one gram quinine in solution taken on a nearly empty stomach in the morning, every tenth and also eleventh day. If fever still persists, the dose can be increased to 1.5 gm., reducing the interval to one and two days. He warns that quinine is not absorbed unless the gastric reaction is acid.—*Journal of the American Medical Association.*

Influence of the Imagination.—Slosson recently reports in the *Psychological Review* the following experiment, which clearly indicates, not only the remarkable power of the imagination, but also the fact that the majority of men and women are ruled by their imaginations rather than by the tangible evidence of their senses: In the course of a popular lecture he presented to his audience a bottle containing distilled water, which he uncorked with elaborate precautions, and then, watch in hand, he asked those present to indicate the exact moment at which the peculiar odor was perceived by them. Within fifteen seconds those immediately in front of him held up their hands, and within forty seconds those at the other end of the room declared that they distinctly perceived the odor. There

was an obstinate minority, largely composed of men, who stoutly declared their inability to detect any odor, but Mr. Slosson believes that many more would have given in had he not been compelled to bring the experiment to a close within a minute after opening the bottle, several persons in the front rank finding the odor so powerful that they hastily quitted the lecture-room.

Submersion in the Treatment of Wounds.— The use of the hot bath in poisoned wounds, to which attention has recently been called by Fraser, is noticed by Hodges (*West. Med. Review; J. A. M. A.*). His extensive experience with the procedure, he claims, warrants the following practical conclusions: (1) Continuous submersion even for long periods, two or three months if necessary, is altogether harmless. (2) It may be easily secured anywhere by anyone possessing an ordinary degree of ingenuity. (3) It will almost instantly limit infectious gangrene, and control the resulting septicemia and spanemia. (4) It will quickly relieve the pain and discomfort of phlegmonous inflammation or cellulitis. (5) It will speedily reduce temperature and pulse, and overcome the consequent depression of the patient's vital forces. (6) The temperature of the bath is immaterial, except that when below the temperature of the room, it more promptly reduces fever, and many bacteria will not develop at this temperature, while such as do will develop less vigorously than at a slightly higher temperature.— *Medical Times, February, 1901.*

A Method for the Simultaneous Staining of Blood Smears with Eosin and Methylene Blue.— E. A. Willebrand (*Deutsche Med. Woch.*, Jan. 24 and 31, 1901) describes a new stain which gives more clearly differentiated pictures than Ehrlich's triacid mixture, Gollash's eosin-hematoxylin, etc. If dried blood smears be stained with a simple mixture of eosin and methylene blue, the results are unsatisfactory, for one stain usually preponderates over the other, according to the proportions of the mixture, and it is difficult to find a formula in which the two stains balance. If acid is added to such a mixture, however, the staining powers of the eosin are accentuated, while the addition of alkali makes the blue the stronger element, and this fact renders an accurate regulation of the result possible. The writer's formula is equal parts of 0.5 per cent alcoholic eosin and concentrated watery solution of methylene blue. To 50 c.c. of this mixture ten to fifteen drops of one-per-cent acetic acid are added (the exact amount being determined by experiment), when the erythrocytes will be found stained red, the nuclei blue, the neutrophile granules violet, the eosinophile granules red, and those of the mast cells an intense blue.— *Medical Record.*

The Disinfecting Properties of Alcohol and Alcohol Vapor.— G. Frank (*Münchener Med. Wochenschrift*, Jan. 22 and 29, 1901) is of the opinion that the modern tendency to ascribe to this agent only a secondary rôle in the various disinfecting procedures in vogue is not borne out by the facts, and his experiments with anthrax spores seem to justify his views. These very resistant organisms perish in a few minutes after exposure to alcohol or its vapor, and it is worthy of note that the intensity of action is not dependent upon the concentration of the chemical. Most micro-organisms are surrounded by an envelope which, on contact with the strongly hygroscopic absolute alcohol, loses water, and shriveling becomes more resistant, while if a certain amount of water is present, this action does not take place, and the disinfectant more easily gains access to the germ within, and its destruction is assured.— *Medical Record.*

The Treatment of Erysipelas.— N. G. Keirle, Jr. (Philadelphia *Medical Journal*, Feb. 16, 1901), reports this treatment which has met with great success in his hands: The affected area is first inclosed in a painted ring of tincture of iodine. This ring is not to be started at the margin of the reddened area, but from two to three inches from it, and enough coats should be given to cause a slight desquamation of the upper layers of the skin. The whole surface within the ring is to be covered with ichthyol ointment, about one dram to one or two ounces of vaseline. This is covered with a piece of gauze, and a hot stupe applied and changed about every four hours. At the

end of twelve hours the ointment is washed off and a fresh coat applied. If necessary, more iodine may be used. Internal treatment may or may not be given.—*Medical Record.*

The Increasing Prevalence of Cancer.—Dr. Roger Williams, of Bristol, England (*Med. Press. and Circ.*, Sept. 19, 1900), calls attention to the rapid increase of cancer in France, England, and other wealthy countries. He attributes the increase of this disease to the growth of luxurious habits and especially the use of flesh food. The death-rate from cancer in France increased 33½% within the twenty years preceding 1895, being in 1876, 7.6 per 10,000 of the population; in 1895, 10, or one to the thousand. In England the mortality from cancer has increased from 2.9 in 1850, to 7.5 at the present time. Cancer is almost entirely unknown in North Africa, where the habits of the people are frugal, and where flesh food is very little used. In Sardinia the death-rate is less than 2 to 10,000. An almost equally low death-rate is found in other countries where the people lead an open-air life and make little use of flesh food.

Farinaceous Soup Diet in Typhoid Fever.—A. Siebert reports in the *Northwestern Lancet*, Oct. 1, 1900, results of his experiments in the treatment of 153 cases of typhoid fever in which the diet consisted exclusively of barley, rice, lentil, or pea soup, thoroughly boiled and strained. After the first few days the yolk of a fresh egg was added to the soup. The patient was given about two quarts of the soup in twenty-four hours. The good results of this dietary have been absence of delirium, clean tongue, disappearance of diarrhea when present, and easy control of temperature.

Therapeutic Significance of the Hot-Air Douche.— Dr. Julian Marcuse (*Wiener klinische Rundschau*, Dec. 23, 1900) prefers this to the hot-air bath, as it does not necessitate the patient's lying still for hours at a time, and permits the action of the hot air on any desired part of the body. The hot-air douche stimulates the skin and the subcutaneous lymph and blood vessels, and, combined with massage, forms a valuable therapeutic measure for gouty, rheumatic, and neuralgic affections. — *New York Medical Journal.*

Passing of the Fiji Islanders.—Dr. Morgan I. Finncane (Boston *Medical and Surgical Journal*), who is medical inspector of the colony, makes the statement that the black tribe of Fiji Islanders is dying out. The cause is due not only to the small birth-rate, but to an enormous infant mortality, caused by sanitary neglect, filthy houses, and the absence of skilled physicians.

Successful Treatment of Laryngeal Tuberculosis.—Imhofer recommends curetting of the diseased surface after anesthetizing with a twenty- to twenty-five-per-cent cocain solution. In mild cases the diseased tissues may be destroyed with lactic acid. He has been able to secure recovery, even in very advanced cases, by this method.

Depressing the Tongue for Hiccough.—Dr. Kolipinsky reports in the *American Medical Journal* the discovery that depression of the tongue will arrest persistent hiccough.

Iodoform Solution for Injection.—Lannelongue employs the following mixture: Iodoform, ether, each 2½ drams; creosote, 30 minims; sterilized olive oil, 3 ounces. Kirmisson, Henle, and numerous others report remarkable results from the use of this or a similar solution in cases of tuberculosis in various localities, perfect cures resulting in a very large proportion of cases.

H. SCHALI. records in the *Archives d'Electricité Médicale* (Nov. 15, 1900) the observation that in the application of the Roentgen ray in the treatment of lupus, it is necessary to employ slow interruptions, forty to sixty per second, rather than the high-frequency apparatus, two or three thousand per second and more. He found when the high-frequency current was used that no effects whatever were obtained, but with the application averaging fifty per second, rapid cicatrization was secured.

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

The Etiology of Yellow Fever.— Doctors Walter Reed, James Carroll, and Aristides Agramonte, United States Army, presented a paper on this subject before the meeting of the Pan-American Medical Congress which convened at Havana, Cuba, February 4–8. The following is an abstract of the paper as it appeared in the *Medical Record* of Feb. 16, 1901 :—

"In the preliminary note read before the American Public Health Association at its meeting at Indianapolis, Ind., Oct. 22–26, 1900, we arrived at the conclusion, based on observations made by us, that the mosquito is the intermediate host for the parasite of yellow fever.

"In this additional note we present the results of our further investigations on this important subject, which we have continued at an experimental sanitary station (Camp Lazear) near the town of Quemados, Cuba.

"At this station, in strict quarantine, and with every source of infection absolutely excluded, we have succeeded in infecting 85.71 per cent of those individuals who have been bitten by purposely contaminated mosquitoes (*Culex fasciatus*). Our observations do not conform with the opinion that mosquitoes carry the specific agent in their proboscis, and simply transfer it from one individual to another in a mechanical way, but appear to demonstrate that the parasite of this disease must undergo a definite cycle of development in the body of the mosquito before the latter is capable of conveying infection. This period would seem to be not less than twelve days.

"We also consider in this paper the question of house infection, and are able to show that this infection is due to the presence of mosquitoes that have previously bitten yellow-fever patients; and that the danger of contracting the disease may be avoided in the case of nonimmune individuals who sleep in this building, by the use of a wire screen.

"We also demonstrate by observations made at this camp that clothing and bedding contaminated by contact with yellow-fever cases, or by the excreta of these patients, is absolutely without effect in conveying this disease.

"Conclusions: 1. The mosquito (*Culex fasciatus*) serves as an intermediate host for the parasite of yellow fever.

"2. Yellow fever is transmitted to the nonimmune individual by a mosquito that has previously fed on the blood of those sick with this disease.

"3. An interval of about twelve days or more after contamination appears to be necessary before the mosquito is capable of conveying the infection.

"4. The bite of the mosquito at any earlier period after contamination does not appear to confer any immunity against subsequent attacks.

"5. Yellow fever can also be experimentally produced by subcutaneous injection of blood taken from the general circulation during the first and second days of this disease.

"6. An attack of yellow fever, produced by the bite of the mosquito, confers immunity against a subsequent injection of the blood of an individual suffering from the nonexperimental form of this disease.

"7. The period of incubation in thirteen cases of yellow fever has averaged from forty-one hours to five days and seventeen hours.

"8. Yellow fever is not conveyed by fomites, and hence disinfection of articles of clothing, bedding, and merchandise supposedly contaminated by contact with those sick of this disease, is unnecessary.

"9. A house may be said to be infected with yellow fever only when there are present within its walls contaminated mosquitoes, capable of conveying the parasite of this disease.

"10. The spread of yellow fever can be most effectually controlled by measures directed to the destruction of mosquitoes and the protection of the sick against the bite of these insects.

"11. While the mode of propagation of yellow fever has now been definitely determined, the specific cause of this disease remains to be discovered."—*Medical Record, Feb. 16, 1901.*

Pathology of Puerperal Sepsis.— Alfred Bass (*Centralblatt für die Grenzebiete der Medizin und Chirurgie*, Nov. 22, 1900) draws the following conclusions: (1) The uterine cavity of healthy unexam-

ined pregnant women, and in most cases that of healthy post-partum patients, is free from pathogenic germs. (2) The question as to whether the vagina of healthy, unexamined, and nonirrigated pregnant women and post-partum cases is free from pathogenic bacteria, can not at present be definitely answered, even though a series of observations point in this direction. (3) Autoinfection in any given case must be diagnosed only when every possibility of external infection has been excluded; then autoinfection, Ahlfeld's view notwithstanding, will be found as a very rare occurrence. (4) The following bacteria have been found as causes of puerperal sepsis: Streptococcus pyogenes, staphylococcus pyogenes aureus and albus, bacterium coli commune, pneumococcus, typhoid, and diphtheria bacilli, bacillus aerogenes capsulatus, and vibrion septique. (5) The portal of infection is most frequently the endometrium, especially the placental site, both of which are reached by the direct introduction as well as the rapid growth of the bacteria.. (6) The way of infection is lymphatic or circulatory, seldom both at the same time. (7) A positive clinical differentiation of the various bacterial forms can not be determined, though the anaerobic infection runs a milder and more favorable course. (8) The blood examination, with the exception of bacteriemia, shows nothing characteristic for puerperal sepsis.—*Medical Record, Feb. 16, 1901.*

The Bacterial Diagnosis of the Gonococcus.— Oscar Richardson (Boston *Medical and Surgical Journal*, Feb. 7, 1901) gives minute directions for the detection of the gonococcus. The necessity of rigidly subjecting the suspected gonococci, obtained in cultures, to certain criteria described, is emphasized by a recent observation of a case of acute arthritis of the knee, clinically of gonorrheal origin. Cover-glass examination of the exudate showed Gram decolorizing cocci inside of the pus cells, which were regarded at the time as gonococci. At the time the pathologist had no doubt that the case was one of gonorrheal arthritis. The cultures, however, from the exudate in the knee, showed an organism which had a considerable resemblance to the gonococcus, so much so that, only after it had been cultivated through a number of generations and had been carefully subjected to various tests, it was declared not to be the gonococcus.—*Medical Record, Feb. 16, 1901.*

Microbes in Venous Thrombosis. —M. Jakowski (*Centralblatt f. Bakteriologie (Jena)* December 8, 24, and 28), reports that venous thrombosis has been noted after typhoid fever, croupous pneumonia, puerperal affections, and general septic pyemia. Two cases have been published consecutive to gonorrhea, and Korzon has recently reported a case of pyemia in the course of crural thrombosis during pregnancy. Jakowski has been experimenting on animals, injecting diphtheria or typhoid bacilli and toxins, and then applying a ligature to the limb. The toxins alone, combined with constriction, failed to induce thrombosis, and the tests were constantly negative in case of constriction alone. But injection on the bacilli and constriction resulted in the production of more or less thrombosis in every case. The bacteria probably lodged at some slight lesion in the vessel, possibly where the constriction was applied, and there elaborated their toxins. These toxins in turn acted destructively on the morphological elements of the blood, breaking them up and liberating the fibrin ferment, thus causing the formation of a clot.—*Journal American Medical Association, Feb. 23, 1901.*

Localization of the Lepra Bacillus. — E. Jeanselme has returned from a special expedition in the Orient, undertaken for the purpose of studying leprosy. He is convinced that bacteriological examination will prove of great assistance in dubious diagnoses of leprosy, but warn that the bacilli, after having invaded the entire organism, may disappear completely, leaving merely a sclerosis in their track. The chief localizations are the nasal and bucco-pharyngeal mucosa, but all the secretions and even the excretions may be virulent, except the urine, which does not contain bacilli. Prophylactic measures should therefore aim to sterilize the nose, mouth, and skin, with occlusion of all ulcerations, and compulsory disinfection of garments, linen, and all vessels, etc., used. The child of a leprous woman should be taken away from her immediately after birth, and never given

to another woman to nurse.—*Journal of the American Medical Association.*

The Bacterial Toxins.—Victor C. Vaughn and Thomas B. Cooley (*Jour. Am. Med Ass'n.*, Feb. 23, 1901) believe that the colon bacillus in virulent form contains within the cell a toxin which is fatal to guinea pigs of from 200 to 300 gm. weight, in quantities of less than 7 mgm. The aqueous extract of the cells of the colon bacillus grown on agar is inert. The entire germ is highly resistant to heat and to dilute acids and alkalies. The cell wall of the colon bacillus is digested by the prolonged action of artificial gastric juice, which does not alter the toxin. The toxin as thus obtained is insoluble, or but slightly soluble, in dilute acid, but is slightly soluble in water, and more readily in dilute alkalies. This toxin responds to the ordinary proteid reactions. The toxin, after being freed from the cell membrane, is not destroyed by being boiled.—*Medical Record.*

Bacteriological Examination of the Blood in Pneumonia.— Prochaska (*Centralb. für in. Med.*, 1900, No. 46) reports the result of a series of studies of this character, undertaken to attempt to settle the question whether or not the pneumococcus occurs in the blood in pneumonia. There has been considerable conflicting testimony in regard to the matter. His technique was to draw the blood from a brachial vein and to mix it with bouillon. The results were positive only when large amounts of blood were used. Ten cases were taken at random, and all showed the presence of the pneumococcus in the blood. In four cases there were complications, empyema and gangrene of the lung once each, and acute nephritis twice. In the other six cases the disease was uncomplicated and not very severe. Four cases died.—*International Medical Magazine, January, 1900.*

The Diagnostic Importance of the Meningococcus Intercellularis.—Fisher (*Pediatrics*, Oct. 15, 1900) considers the finding of the meningococcus of Weichselbaum in the fluid obtained by lumbar puncture during life to be of the greatest importance in differentiating the epidemic from the sporadic form of cerebrospinal meningitis. The organism occurs in pairs or tetrads within the pus corpuscles; it is easily stained with Ziehl's solution, grows on the ordinary culture media, yielding a yellowish, shining, and somewhat slimy growth. It is pathogenic for dogs and goats, but not for rabbits and guinea pigs.—*International Medical Magazine.*

Bacillus Anthracis in the Peritoneum of the Guinea Pig.—Dr. J. W. Van Leent (*Centralblatt für Bakteriologie, Parasitenkunde, und Infektionskrankheiten*, Dec. 15, 1900) concludes from his experiments that anthrax bacilli perish in the peritoneal cavity of guinea pigs, even when introduced in enormous quantities, and when the animal dies of the subcutaneous injection of the same germ. While the absorption of the bacilli is very dangerous to the animal, absorption of the fluid from the peritoneum will be beneficial. Foreign bodies, or too much fluid in the cavity, may interfere with the bactericidal action of the peritoneum. Phagocytosis of the endothelial cells, especially of the omentum, plays an important bactericidal rôle.

Diplococcus Influenza.—Dr. Schtschegolew (*Deutsche Medizinal-Zeitung*, Dec. 10, 1900) describes a number of cases which ran the clinical course of influenza and seemed to be contagious, in which he succeeded in isolating a diplococcus that had some biological distinction from the ordinary diplococcus found in pneumonia. The same organism was detected in cases of acute conjunctivitis. One of the patients developed pneumonia and died of it. The writer thinks the morphological differences may be attributed to the changes which take place when the diplococcus of Fränkel and Weichselbaum is transplanted to agar.—*New York Medical Journal.*

The Colon Bacillus in Cystitis.—Dr. T. R. Brown has recently shown by careful bacteriological study of more than eighty cases of cystitis that the colon bacillus is the most common cause of cystitis and pyelitis in women.

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HYDROTHERAPY IN DISPENSARY PRACTICE.

No intelligent physician who has had an opportunity to attend for any length of time a well-patronized city dispensary in this country or Europe, has failed to notice a large number of patients among the regular attendants of these places who have habitually sought relief at the same or similar institutions during many months or years, but without being to any considerable degree bettered. Patients not infrequently in the account of their cases mention a long list of city dispensaries at which they have attended for many weeks or months steadily with only partial and merely palliative results. The failure to cure these unfortunate cases is usually attributed to poor constitution, defective environment, or some other insurmountable obstacle which prevents the therapeutic measures applied from having a fair chance for a cure.

Among these habitual dispensary frequenters there are also found a large number suffering from so-called "fever sores," varicose ulcers, etc., generally located on the front of the leg, not infrequently involving the whole circumference of the leg for a hand-width. Chronic rheumatics, cases of chronic lumbago, indigestion in various forms, nervous headaches, and such common forms of skin diseases as eczema and psoriasis, are exceedingly common. That these cases are not generally promptly cured by the ordinary dispensary methods everybody knows, but they ought not on that account to be pronounced incurable, for in the writer's opinion there should remain but a very small proportion of patients of the class mentioned who may not be very substantially relieved, and the great majority may be practically cured, by the thorough application of measures which are only well recognized by the rational medicine of the present day. For example, the majority of cases of chronic ulcer may be readily cured by rest, massage, and the alternate or hot and cold spray for five to ten minutes twice daily. A bandage must be applied, and it is well also to apply an antiseptic dressing of some sort, as iodoform and vaseline, or some other unirritating nontiseptic. The writer has often seen cases of this sort recover within two to three weeks, who had been drifting about for years in dispensaries, continually getting worse. Muscular and articular rheumatism in their various forms require something more effective than salicylic acid or iodide of potash. Hot baths followed by cold hydriatic applications work like magic in the majority of these cases. A large, very hot fomentation applied over the back of one suffering from lumbago, repeated twice daily for two or three days, followed by massage and a dry cotton pack, will generally set him free from his pain and permit him to return to his work as a coal heaver, or a cartman, or whatever his business may be. General tonic hydriatic treatment, together with the observance of a proper diet will often work marvels in cases of chronic indigestion, for example, the patient simply being required to abstain from the use of tea and coffee, especially iced tea, ice water, and drinks of all sorts at meal time, and to confine his diet to dry food, which demands thorough mastication, and to avoid greasy dishes, pies and other pastries, sweets and condiments. These measures secure astonishing results in cases which have long resisted the use of all medicinal agents.

THE COD-LIVER-OIL FALLACY.

A CHEMICAL company has recently announced in the advertising columns of the medical journals that "when the active principles are taken from cod-liver oil, only grease remains, and that is of no more value than other grease. The virtue of cod-liver oil lies in its curative principles, which are separable from the grease." This statement is undoubtedly true. Some years ago an eminent English chemical firm undertook an exhaustive study of cod-liver oil, and made the interesting discovery, which was published in the medical journals, that the active principles of cod-liver oil consist only of certain ptomains, or toxic substances, which are the result of putrefactive processes. Putting these two interesting facts together, it is clearly seen that cod-liver oil is simply common "grease" plus some ordinary ptomains which result from putrefaction.

Many intelligent practitioners have observed that cod-liver oil is actually inferior to good dairy butter or rich cream, and that there is no virtue whatever in the so-called "active principles," which, being toxins, can not be possessed of any curative value. Olive oil, nut oils, and even cottonseed oil, may be obtained in a state of much greater purity and in more digestible form than fat in the shape of cod-liver oil. But, after all, these substances are grease or separated fat, and hence are difficult of digestion. Fats in a natural state are in the form of an emulsion, and mix readily with water and with the fluids found in the stomach and other digestive organs, and so do not interfere with the digestion of other food elements. Sweet sterilized cream is one of the most digestible forms of fat. But there are a few persons who can not take cow's milk in any form. For all such individuals, such nuts as almonds, pecans, and filberts are to be recommended. Almonds and filberts can be easily made into a most delicious cream by simply blanching and crushing, then mixing with a little water. The ripe olive, which can now be obtained in Southern California, affords the most wholesome supply of easily digestible fat. A great advantage in the use of these simple vegetable fats is that they can be eaten and assimilated in very much greater quantity than the rancid animal fats which are sold under the name of "cod-liver oil."

Spinal Curvature from Wrong Sitting Positions.— Careful investigations made in various European cities have developed the startling fact that in most schools a large proportion of the students, even at an early age, have developed curvature of the spine as the result of the wrong attitudes assumed in sitting while at their studies.

In Dresden, for example, Professor Kunig found lateral curvature in twenty-four per cent of the pupils in the common school. This is truly a terrible spectable,— one fourth of all the boys and girls in the public schools deformed before they have reached maturity. Many more girls are affected than boys, in the proportion of about five to one. This would make forty per cent of all the girls deformed. Apparently the only curvatures considered in these investigations were lateral curvatures. Posterior curvature of the upper part of the spine, giving rise to so-called "round shoulders" and the consequent flat chest, is a condition much more common even than lateral deviation of the spine. The habitual posture, whether sitting or standing, constitutes a mold by which the body is shaped, especially during development.

Curvature of the spine is a matter of importance not only from a histological standpoint, but because of the direct relation between external deformities of this sort and internal displacements of the

viscera, such as prolapsed stomach, movable kidney, and prolapsed liver and bowels. It is strange that among civilized people so little attention is given to the development of a good physique and erect carriage of the body. Among many half-civilized tribes, as the Arabs, for example, great attention is given to this matter. Children are taught from earliest infancy to walk, sit, and stand erect, and as the result spinal curvature is practically unknown among the children of the desert.

Chloride of Sodium.— Toulouse and Richet, of Paris, have directed attention to the importance of a nonflesh dietary and the disuse of salt in the treatment of epileptics, especially in connection with the use of bromide of potash. By this method the writers claim to have reduced the number of convulsions ninety-two per cent; the number of attacks of vertigo, seventy per cent. It is generally conceded that epileptic attacks are produced by the accumulation of waste products, and it is possible that the withholding of chloride of sodium facilitates the elimination of these products, as it lessens the amount of work required of the skin and kidneys, a great share of the chloride of sodium taken with the food being eliminated through these organs.

The writer has for many years made a practice of withholding flesh foods in all cases of epilepsy, and has in the majority of cases seen most excellent results from this dietary, in connection with vigorous hydriatic treatment and active gymnastics. The treatment of this disease by means of the bromides promises little, and it is more than probable that diet and regimen are capable of accomplishing more in this malady without medication than can be accomplished in combination with the bromides as customarily employed. A number of years ago the *Western Medical Review* made a collective investigation of the effects of potash in the treatment of this disease, in which the testimony of a large number of insane-asylum physicians and others having charge of epileptics was given respecting the influence of the bromides. The almost universal testimony was that the so-called bromide treatment was rarely successful, and that in the great majority of cases more harm was done than good, through the disturbance of the patient's nutritive and intellectual functions.

Physique and Mental Activity.— Some eight years ago Dr. W. T. Porter, by a careful comparison of the weights of school children with their class standing, observed that the duller children were on the average smaller in size for their age than the bright ones. More recently Dr. H. G. Beyer, of the United States Navy, has made a similar investigation with results strongly confirmatory of Dr. Porter's conclusions. This view is at variance with notions which have been expressed by some other observers, but on the whole agrees with the conclusions reached by common experience. A man possessed of a large, strong body, ought on the average to be able to do more mental work, as well as physical work, and of a better quality. But it is not always the biggest man who is the strongest physically, and it is especially noticeable that men of smaller size often show greater endurance than do large men. In a twenty-five-mile running race held last April, in Massachusetts, ending in Boston, only one of the men who finished weighed more than one hundred pounds at the start. The light-weight men were the winners.

Prostatectomy.— Delageniere has recently proposed the following method of operation for removal of the prostate: A semilunar incision is made, the convexity inward, the center of the curve lying at the center of the perineum, the semicircle

ending over opposite the ischiofossa on either side of the anus. The rectum is separated from the prostate by blunt dissection, the capsule of the gland is incised, and the gland is then removed by enucleation and snipping with the scissors, care being taken to avoid wounding the urethra. If a wound is made, it is closed by suture. The wound is drained and closed, and continuous catheterization is practiced for a week or ten days. If the prostate is large and difficult to reach, a suprapubic cystotomy is made, and the prostate pressed down into the wound. After the capsule is incised, it is seized with forceps and dragged down so that the dissection can be more readily made. In some cases the gland or a considerable portion of it can be enucleated by blunt dissection with the finger nail.

The Mosaic Code Confirmed.—The sanitary laws of Moses have been the standard upon which all sanitary legislation has since been based. Its rules for quarantine, for disinfection, and the sanitary rules respecting foods have never been improved upon in the slightest degree until the most recent times, and since so great light has been thrown upon these subjects by the developments of bacteriology and physiological chemistry. A recent confirmation of the instructions respecting clean and unclean animals, at least as regards the forbidding of horseflesh as food, has lately been brought forward by M. Pflüger, who has been investigating experimentally the value of horseflesh as food. He finds that the use of horseflesh as a diet is injurious, producing decidedly harmful effects.

The Progress of Anesthesia under Chloroform.—Anesthesia begins with the extremities; touch is lost first, then the sense of pain and heat and cold. Anesthesia extends from the extremities to the thorax, abdomen, the head, neck, forehead, the left temple, then the right. In general, anesthesia begins first on the left side, extending to the right side. It affects last the cornea and the mucous membrane near the canine teeth. The nasseter muscles are the last of the muscles to yield to the relaxing influence of the drug.

Nervous Dyspepsia and Gastric Dilatation.—Recent observations show that gastric dilatation is present in the majority of cases in so-called "gastric neurasthenia," confirming the suspicion which has existed in the minds of observing physicians for many years back, that so-called "nervous dyspepsia," or "gastric neurasthenia," is simply a form of autointoxication.

REVIEWS.

A PRACTICAL TREATISE ON NERVOUS EXHAUSTION (NEURASTHENIA), ITS SYMPTOMS, NATURE, SEQUENCES, TREATMENT.— By George M. Beard, A. M., M. D., fellow of the New York Academy of Medicine, of the New York Academy of Sciences, vice-president of the American Neurological Association, of the American Medical Association, the New York Neurological Society, etc. Edited, with notes and additions, by A. D. Rockwell, A. M., M. D., Professor of Electro-therapeutics in the New York Post-Graduate Medical School and Hospital; fellow of the New York Academy; member of the American Neurological Association, of the New York Neurological Society, etc. Fourth edition, enlarged — 1901. E. B. Treat & Co., 241-243 West 23d St., New York. Price $2.00, net.

It is a fact acknowledged by the medical profession that the term "neurasthenia" as it is commonly used means very little, and that in many cases it is improperly applied, because the physician is at a loss to diagnose his case rightly and tries to cover up his ignorance by the use of this much-abused term.

To the authors of this work is due the credit of dispelling many of the mysticisms surrounding the disorders commonly diagnosed as neurasthenia. After long study and observation they have, in the various editions of their work, analyzed and grouped the symptoms of this disorder in such a way that there is now no excuse for attaching the term neurasthenia to doubtful cases.

We are glad to recommend this book to all interested in this subject.

The Battle Creek Sanitarium

LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
NEWTON EVANS, M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR MARCH.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total
104 per cent.	10		10
102 " "	3	1	4
100 " "	65	39	104
93 " "	2		2
98 " "	4		4
97 " "	1	1	2
96 " "	22	24	46
93 " "	24	26	50
89 " "	4	5	9
86 " "	7	2	9
82 " "	1	1	2
80 " "	1		1
79 " "	8	8	16
75 " "	1	2	3
71 " "	2	4	6
68 " "		1	1
Total	155	114	269

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	46	25	71
Between 4,500,000 and 5,000,000	47	32	79
" 4,000,000 " 4,500,000	42	24	66
" 3,500,000 " 4,000,000	13	22	35
" 3,000,000 " 3,500,000	2	7	9
" 2,500,000 " 3,000,000	2	2	4
Below 2,500,000	3	2	5
Total	155	114	269

Examination of Sputum.— There were 27 examinations made, 25 being new cases. Tubercle bacilli were found in 10 cases.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	37	95	17	100	64	75	118	84
Less than 10,000 bac.	2	5			7	8	9	6
Between 10,000 and 100,000 bac.					5	6	5	4
More than 100,000 bac.					9	11	9	6
Total	39	100	17	100	85	100	141	100

The patients were received from the following States and countries: Michigan, 37; Ohio, 15; Indiana, 13; Illinois, 12; Wisconsin, 11; Iowa, 8; Kentucky, 5; Canada, 5; New York, 4; Kansas, 4; Missouri, 4; Pennsylvania, 4; Nebraska, 3; Minnesota, 2; Tennessee, 2; Colorado, 2; New Jersey, 1; Vermont, 1; Georgia, 1; Alabama, 1; North Dakota, 1; Louisiana, 1; South America, 1. Total, 141.

Urinary Laboratory.— Total number of specimens examined, 794; number of new cases, 275; number of cases having pus, 61; albumin, 20; sugar, 10; casts, 4; blood, 2.

PUBLISHERS' DEPARTMENT.

HYDROZONE AS A GERMICIDE AND HEMOSTATIC.

O. W. GREENE, M. D., in an article on Local Anesthesia in Hemorrhoidal Operations and All Varieties of Minor Surgical Work which appeared in the *Medical Times and Register*, February, 1901, recommends the use of "acestoria" as a local anesthetic, and hydrozone as a germicide and hemostatic. With reference to the use of hydrozone the writer states as follows:—

"The object of using hydrozone is twofold: It is the safest and best germicide and hemostatic we have yet used, and we have tried many. Not being a poison, and depending upon the oxygen it contains for its action, renders it safe under all circumstances, both externally and internally.

"As a dressing we have several times used nothing, simply cleansing with hot water and hydrozone.

"An ideal dressing is ordinary sterilized gauze moistened with glycozone. Glycozone is anhydrous glycerine saturated with ozone, a powerful germicide, and promoter of healthy granulation."

SOLUBLE ELASTIC CAPSULES

A pleasant and superior means for the administration of remedies possessing purgent, acrid, or oily properties. When such substances are enclosed in an envelope of flexible gelatin, you not only avoid giving offense to the palate, but are enabled to administer them with greater ease and in larger single doses. Soluble Elastic Capsules are prepared from the finest French gelatin. We have a complete line—seventy-five staple formulas—put up in boxes containing 1 doz., 2 doz., and 100 capsules. See our price list, and write us for literature. Great is the demand for the following formulas; you will be pleased if you try them:

No. 160–Creosote Comp.
BRONCHIAL.
(DR. W. H. DEWITT.)

Beechwood Creosote,	2 mins.
Oil Eucalyptus,	2 mins.
Oil Santal,	2 mins.

No. 85–Salol Compound.

Salol,	3 1-2 grs.
Copaiba,	10 mins.
Oleoresin Cubeb,	5 mins.
Pepsin Aseptic (1:3000),	1 gr.

No. 162–Methylene Blue Co.
(DR. ORVILLE HORWITZ.)

Methylene Blue,	1 gr.
Copaiba,	1 1-2 mins.
Oil Santal,	1 1-2 mins.
Oil Cinnamon,	1-2 min.

No. 89—SANTAL OIL, 5 Mins. **No. 46—SANTAL OIL, 10 Mins.**

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ORIGINAL ARTICLES.

THE OUTDOOR GYMNASIUM.[1]

BY J. H. KELLOGG, M. D.

MAN is naturally a tropical animal, and many centuries of exposure to the perverting influences of civilization have not yet so far changed his constitution as to enable him to thrive under the abnormal conditions afforded by the modern air-tight and light-proof houses, and in the stuffy air of modern counting-rooms. The city man is a deteriorated animal, as the result of the increasing aggregation of human beings in the cities.

Most civilized nations are rapidly degenerating toward extinction. J. Ernest Charles recently asserted in a prominent French Journal, *Revue Bleue*, that, at the present rate of degeneration, in one hundred years from now France will be known only as a historical country. Switzerland is moving in the same direction, and New England also. The blight is extending westward. One can not watch for ten minutes the stream of people scurrying along a crowded thoroughfare in one of our great cities, without being profoundly impressed with the blighting influence of a sedentary and indoor life. Pale, sallow faces, sunken, lusterless eyes, narrow chests, stooped figures, lank limbs, and a general weazened appearance, speak in pathetic tones of the destructive influence of the artificial life imposed by our modern civilization upon multitudes of human beings. To these men and women the so-called blessings of civilized society can scarcely be regarded as adequate compensation for the evils and miseries growing out of conventional usages and demands.

Space will not permit a general discussion of the causes of race deterioration, evidence of which can be seen on every hand in every civilized country. More than a quarter of a century of experience with invalids of all classes, and a careful study of habits in relation to health, have convinced the writer that indoor life and neglect of exercise, if not the most important, are at least among the most important of the influences which are responsible for the physical decay that finds its expression in the rapid increase of constitutional disorders, visceral degeneration, increase of insanity, idiocy, imbecility, and epilepsy, and the multiplication of crime and criminals. In our anxiety to get as far away from savagery as possible, we have gotten so far away from nature in our habits of life, and become so altogether artificial and perverted, that a veritable revolution is needed in every civilized community. A Moses is needed who will lead an exodus out of the Egypt of self-indulgence, of ignorance of bodily rights and needs, and of bondage to perverted tastes and artificial practices, back to the simplicity of natural and wholesome living. A return to nature is the thing needed to correct a great share of the evils in our modern society. This is the central thought in the great movement toward educational reform which has been in progress during the last century, and is no less the dominant idea in rational dress reform, in diet reform, and in other efforts having for their object the correction of erroneous physical habits.

The business man recognizes this principle when in sheer despair he tears himself away from the entanglements of financial affairs, and exchanges the stifling, superheated, poisoned atmosphere of the dark, dingy prison-cell which he calls his office, for the light, the freedom, the sweetness, the naturalness of the forest, by an outing expedition to some locality far away from the sights and sounds and the odors of city life. The transforma-

[1] Presented at the annual meeting of the American Association for the Advancement of Physical Education, N. Y., April, 1901.

tion effected by such a change, even within so short a period as six weeks or possibly less, is often amazing. The sallow color, the depressed expression, the attitude of exhaustion and distress, the leanness and lankness, disappear as if by magic, and the spiritless, tired-out man returns to his work with a new life coursing through his veins, a new energy in his muscles, the nerve-paralyzing toxins cleared out of his brain, and with an enormously increased ability to grapple with the problems which confront him in his business and social life.

If such a marvelous transformation can be effected in so short a time by naturalness of life, especially by muscular activity out of doors, how much greater and better results might be attained by the habitual and systematic employment of the same measures. The difficulty is to get the opportunity. It is to afford the facilities for out-of-door exercise under conditions favorable for giving the greatest possible good in the shortest space of time, that the out-of-door gymnasium is advocated. In out-of-door exercise the body is brought under the influence of exercise, sunlight, and the thermic impressions received from contact with the air.

Exercise, to achieve its greatest benefit, must be combined with light and thermic impressions upon the skin. The greatest benefits of exercise are not the benefits to the muscles, but the improved metabolism, increased blood movement, and respiratory activity. The blood is the great creating, renovating, and healing power of the body. In the words of Holy Writ, "The blood is the life." Fresh, oxygenated blood removes wastes, awakens the poisoned, anesthetized tissues to renewed activity, supplies material for new construction, improves blood movement, increases functional activity, improves the quality of the vital work, renews the tissues, and produces a higher grade of life. Increased respiratory movement not only introduces an increased quantity of oxygen into the system, but aids in moving the blood through the great viscera — the stomach, the liver, the intestines, and the pancreas — which are the fountainheads of the organic life of the body. With each descent of the diaphragm, the liver and the other abdominal viscera are compressed between it and the resisting abdominal walls. Thus the venous blood current is pushed onward to the heart; in other words, vigorous respiratory movement is attended by the alternate squeezing and releasing of the viscera, which empties them of their blood and lymph contents, making way for new material for tissue construction, thus promoting the highest degree of activity of these important centers of vital work.

The influence of light upon the body has been little appreciated hitherto because little understood. Its influence in producing pigmentation of the skin in human beings is a matter of common observation. Solar erythema, or so-called sunburn, is always followed by a deepened color of the skin; after this pigmentation has taken place, the surface involved is less subject to sunburn, and may be wholly protected so long as this deepened color is retained. This process in the skin may accordingly be looked upon as a protective action for the purpose of preserving the deeper and more important structures of the body from injury through the noxious influence of the chemical rays. Negroes and other dark-skinned races are not subject to solar erythema, their skins having by long residence in a hot climate, and through the action of heredity, acquired a natural protection against the chemical ray. We are doubtless unaware how much our ordinary life depends upon the action of the thermal and actinic rays of the sun, especially the latter. The fact that an excessive action of the chemical rays gives rise to an acute inflammatory process in the superficial layers of the skin, is sufficient evidence of its powerful influence upon animal life. In conditions of disease, persons have been found so sensitive that exposure to even the diffused light of day is sufficient to give rise to a marked erythema of the face.

Finsen has, within the last half-dozen years, undertaken an extended series of observations for the purpose of studying more accurately the physiological effects of the actinic ray, making numerous experiments upon flies, worms, embryos, and other forms of animal life. These experiments have demonstrated very clearly that the chemical ray is an excitant of the nervous system, and that under ordinary circumstances it may be considered as one of the most important promoters of animal life and energy. The importance of the thermic influences derived from heat rays need not be emphasized, as this

has long been well known and appreciated; but the fact that the actinic ray is a direct stimulant of the functions of animal and vegetable life, and thus a means of supporting vital energy in all its forms, is a discovery of the highest importance, and one which will doubtless prove of great utility in the future. To the chemical rays rather than to the thermic rays, must in all probability be attributed the greater part of the wonderful results which have long been recognized as following the proper employment of the sun bath, or so-called insolation.

The influence of sunlight upon the vital processes has been recognized from the most ancient times. The Greeks and Romans frequently employed the sun bath, or insolation, in the treatment of chronic maladies. The natives of the South Sea Islands and other primitive peoples still utilize this powerful agent in the treatment of the sick. The natives of the *tierra caliente* of Mexico have long practiced exposure to the sunlight on the sea-beach, as a treatment for syphilis, the patients thus treated being partially covered with sand, and made to drink large quantities of infusions of various leaves while exposed to the sun. The natives of Haiti are said by M. Delow to employ similar measures.

The influence of the solar rays is most active in the summer time because most direct. To receive full benefit from these important physiological agents, the light must be allowed to fall directly upon the skin. This advantage is to some degree obtained in sea bathing, as the bathers often spend fully half the time lying about on the sandy beach, alternately basking in the rays of the sun and dipping beneath the cooling waves. But the bathing dress, scanty as it sometimes is, viewed from the standpoint of conventional modesty, covers so large a portion of the body that there is comparatively little opportunity for the influence of the solar rays. It is important that the whole skin, or so large an area as possible, should be exposed to the action of the sunlight. The outdoor gymnasium affords protection from observation so that the body may be exposed with the scantiest amount of protection, permitting the largest amount of surface possible to receive the vitalizing influence of the sunlight, the aim being to tan the whole skin as well as the face, arms, and feet.

Another means of physical training of the highest value, which, like the sunlight, has been comparatively little appreciated heretofore, is thermic impressions made upon the skin by contact with cold air or water. Neither water nor air have any specific influence upon the skin, at least by contact, but through the abstraction of heat from the body by contact with the skin, or the communication of heat to the body by such contact, most powerful impressions can be made upon every function, tissue, and cell in the body, through the sense-organs and the central nervous system.

An application of cold water in the form of a douche, affusion, rubbing wet sheet, immersion, or any other measure in which cold water is brought in contact with the general surface of the body, is always restorative and invigorating in its influence. A man who has been exhausted by laborious effort in a highly heated atmosphere, finds his muscular power wonderfully re-enforced by an affusion of cold water, cold immersion, a cold shower bath, and especially by a cold douche.

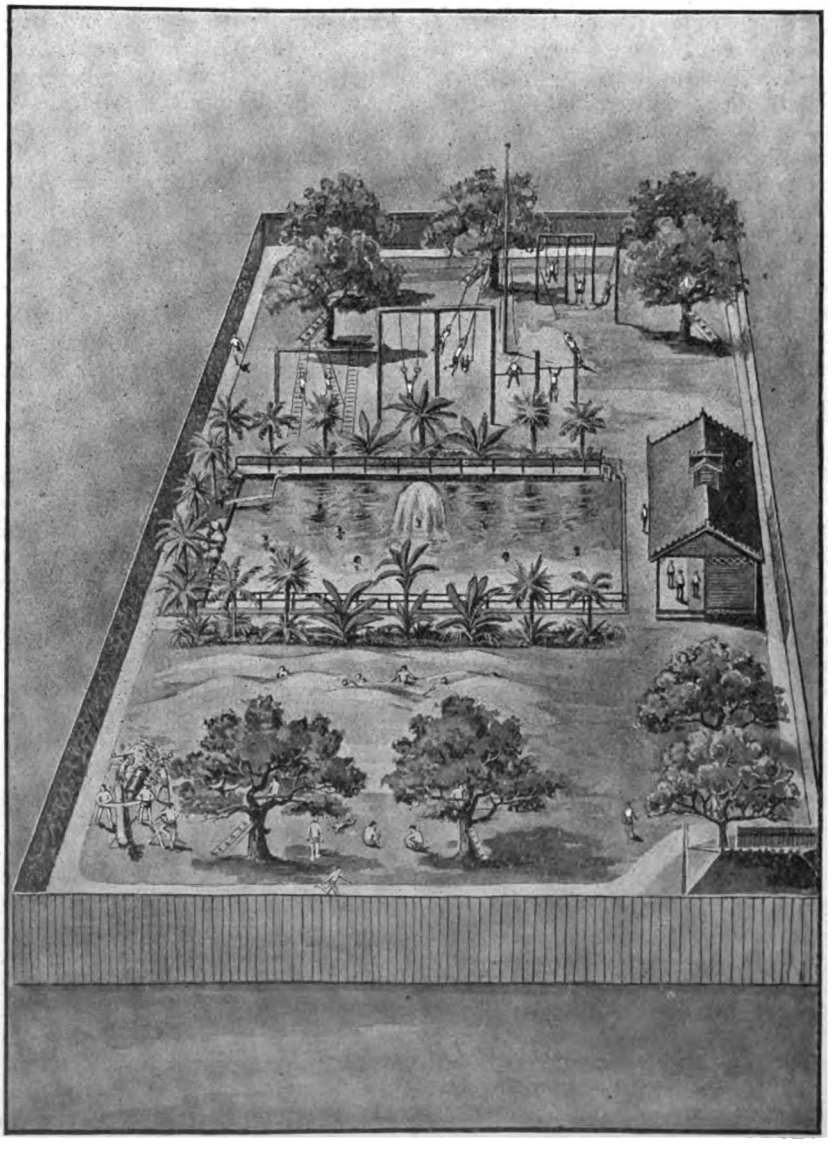
The application of cold water to the face and head has a wonderfully refreshing effect. The brightened expression, the increased vigor, and the relief which follow a simple bathing of the head, face, and neck with cold water when exhausted, are the result of the reflex stimulation of the nerve centers of the brain and spinal cord, and the tonic reaction which follows such an application. When the whole surface of the body instead of a small area is acted upon, the effect is proportionately greater.

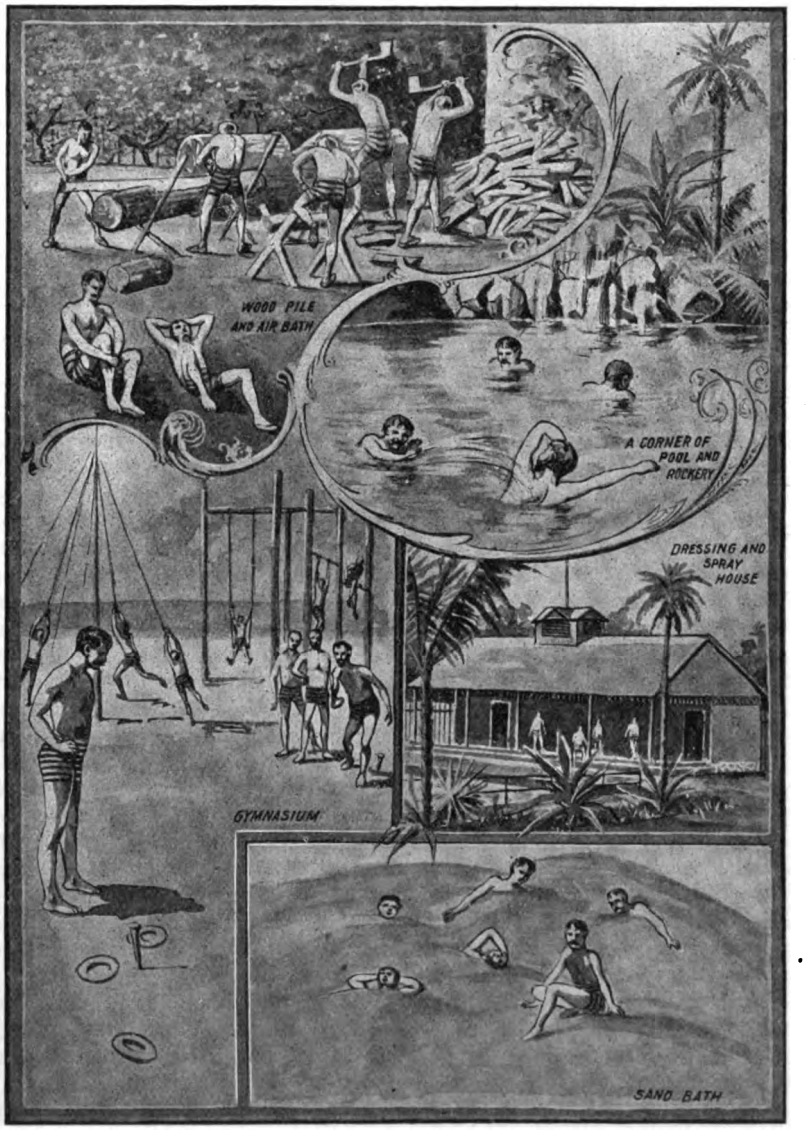
During the heated term thousands of lives have been saved in our great cities by the timely opening of free shower baths in crowded tenement-house districts, whereby the depressing and exhausting effects of a superheated atmosphere might be successfully antagonized and antidoted by the restorative influence of the cold bath.

The tonic effects of cold water are unquestionably to a large degree due to the influence of cold impressions acting through the nerves of the skin upon the sympathetic nerve centers. The great sympathetic nerve controls the blood vessels, glands, heart, the functions of secretion and excretion, and in fact all the vital functions of the body. The awakening of the sympathetic to renewed activity,

or a balancing of its action, is what is especially needed by the great majority of chronic invalids, and the average business man is certain to be more or less of an invalid by the time he is forty, if not before. The functions of the brain and spinal cord, and through them all forms of nervous activity, are to a remarkable extent influenced by the sympathetic. The sensation of well-being which accompanies the reaction following a general cold application, is largely due to the increased activity of the cerebral circulation, brought about through the stimulation of the sympathetic. By its power to influence the sympathetic, hydrotherapy is capable of controlling, restraining, reorganizing, balancing, all the processes of organic life, and through them modifying the functions of animal life to a marvelous degree.

Cold water is a physiological tonic, and has the advantage over medicinal tonics in that it awakens nervous activity without imposing an extra burden upon any vital organ, and without hampering the activity of any function. The cold bath employed in such a manner as to produce tonic effects, accomplishes its results by increasing vital resistance to the causes of pathological processes, by making the wheels of life run more smoothly, by lifting the whole vital economy to a higher level. The impression made upon that harp of a million strings, the skin, with its vast network of sensory, motor, sympathetic, vasomotor, and thermic nerves, arouses every nerve center, every sympathetic ganglion, every sensory and motor filament in the entire body to heightened life and activity. Every blood vessel throbs and every cell quivers with a new life; the whole body thrills with quickened impulses, the whole being is translated into a new state of existence.





In making our open-air gymnasium, we selected a square plot one tenth of a mile in circumference, and surrounded it by a tight board fence ten feet high. A running path six feet in width, covered with sand, extends around the entire inclosure, next inside the wall. The facilities for exercise comprise swinging rings, horizontal ladders, parallel bars, horizontal bars, a Maypole, Indian clubs, dumbbells, quoits, lawn-tennis grounds, and provision for various gymnastic games; besides these there is a wood-pile supplied with axes, saws, sawbucks, and logs of different sizes. In the center of the inclosure is a swimming pool, 35 by 70 feet, 8 feet in depth at one end, 4 feet at the other. Suitable arrangements are provided for heating the water so that the temperature may be maintained between 65° and 70°. When desired, provision is made for exercise in rowing by means of a boat placed in the pool and moored by an elastic rubber rope. A suitable building near the center of the grounds, on one side, affords shelter from the sun, and provides ample dressing rooms, toilet rooms, and facilities for rain or horizontal jet douches. Several fine old apple trees which were within the inclosure were allowed to remain as a refuge from the direct rays of the sun in the hottest weather.

The outdoor gymnasium is not employed altogether in such a way as the ordinary indoor gymnasium. The exercise is perhaps less vigorous, but is continued for a much longer time. Patrons of the outdoor gymnasium are encouraged to spend as much time as possible within the gymnasium walls, lying in the lap of nature, so to speak, imbibing life and energy and health from the natural environment, catching health from nature, as it were.

Mr. Ingersoll was in error in making what he supposed was a very wise remark. He said that he thought that if he had

been present at the creation of the world, he would have suggested that health, instead of disease, be made contagious. Mr. Ingersoll was evidently not aware that health is contagious. A man has to work hard to get sick. In order to contract a contagious disease, he must go where it is, or come into physical contact with it in some way. To get a chronic disease, he must labor assiduously for many months or even years before all the vital forces are broken down. Consider the amount of hard labor performed by the average dyspeptic before he acquires a really interesting and notable case of indigestion. Health, on the other hand, lies all about us, ready to be appropriated if we are only willing to accept it. We may breathe it in with the fresh, pure air if we will. We may absorb it with the sunlight. We may find it in the exhilarating glow of the cold bath followed by muscular activity.

The three great elements of the outdoor gymnasium — exercise, sunlight, cold water — co-operate in the most wonderful way, each to intensify the effect of the others.

Exercise wearies the muscles and fatigues the nerve centers. A short cold shower bath and a plunge into the swimming pool almost instantly restore the vigor of the muscles and the nerve centers, slow the excited heart, and increase both the disposition and the capacity for muscular work. Exposure to the sun soothes the irritated nerves, produces a delightful sense of relaxation, and either with or without the aid of a small degree of bodily movement induces vigorous perspiration. The immediate effect is a slight depression of both the cardiac and the nervous activity. Here again the cold bath comes in good play as a regulator and restorer. A short cold shower bath, a plunge into the cool water of the swimming pool, or a cold horizontal jet to the spine, checks excessive perspiration, raises the blood pressure and cardiac tone, and produces a sensation of the most delightful exhilaration and readiness for mental or physical activity of any sort.

Exercise breaks down tissue and removes wastes, while the cold bath promotes the appetite and assimilation. Thus one measure is the complement of the other. Swimming is without question one of the most valuable of all exercises. The position assumed in the water is one of the highest value as a corrective measure, antagonizing the cramped, bent position so naturally assumed in the sitting position. The necessity for holding the head well back restores the curve in the spine, brings the chest well forward in the best possible position for inhalation, while the arm movements executed in propelling the body in the water are the best of all breathing exercises. The bodily effort made, creates a thirst for air, while the contact of cold water with the skin stimulates the respiratory centers, rendering easy the fullest chest movements. The movements of swimming are such as to secure full play of all the great muscular groups, and hence symmetrical and equable development. Putting these several elements together, it is apparent that swimming in cold or cool water may be justly placed at the head of all kinds of bodily exercise as a health-promoting measure.

The outdoor gymnasium affords the best of all means for general physical development for people in ordinary health. Bicycling, horseback riding, bowling, and such games as lawn-tennis and golf, with other moderate out-of-door exercises, have a high value as health promoters, but they lack the added advantages which accrue from the powerful vitalizing influence of the sunshine falling upon a considerable portion of the cutaneous surface and the still more powerful influence of thermic impressions made by the contact of cold water with the skin in the cold douche or the swimming bath.

An outdoor gymnasium ought to be provided in connection with every city school; in the heart of large cities many such gymnasia should be planted as a means of antagonizing the deteriorating influences of city life. They might be conducted in connection with city parks. Provision should be made for different social grades or classes, and special pains should be taken to encourage the use of these means of physical renovation by the poorer classes, especially those who are dwellers in tenement houses and in the crowded cottages in narrow, shaded streets.

Hospitals, sanitariums, asylums, children's homes, and prisons should be considered improperly equipped unless furnished with a suitable outdoor gymnasium of sufficient capacity to accommodate every inmate. Ordinary out-of-door ex-

ercise is beneficial, but exercise under the conditions provided by the outdoor gymnasium, as I have attempted to show, is more than doubly effective as a means of health promotion.

The accompanying cuts very inadequately represent the general plan of the outdoor gymnasium constructed under the direction of the writer, and the plan outlined certainly offers many points for improving modifications. But I feel confident that the special advantages pointed out are based upon sound physiological principles, and that the outdoor gymnasium is bound to become an important factor in the promotion of the public health, while also serving as an important therapeutic measure in connection with hospitals, sanitariums, and other medical institutions, in which chronic invalids are received for care and treatment.

The purpose of this paper has been rather to introduce the subject than to treat it exhaustively, and it is the hope of the writer to be able to present later a considerable amount of scientific data which will set forward in a more definite and exact way the special advantages of physical exercise when systematically combined with the application of the sun's rays to a large portion of the cutaneous surface, and the cold bath administered with scientific direction and precision.

HYDROTHERAPY.[1]

BY T. W. KEOWN, A. B., M. D.
Baltimore, Md.

THE subject which I bring before you this evening is one which is not given that recognition among us to which it is justly and reasonably entitled, judging from the experimental work done, the conclusions arrived at, and the beneficial results which have followed the application of water in the hands of such men as Winternitz, Rochrig, Naumann, Vinaj, Schüller, Baruch. Though I have given the subject considerable thought, yet I fear that it will suffer from my inability to put the matter clearly and concisely before you—to show you some of the results of this treatment in the changes of the blood, blood pressure, general muscle tone, the life, energy, and feeling of well-being that is imparted to the patient.

Hydrotherapy means the application of water in disease; that is, water in any of its forms, vapor, liquid, or solid, internally and externally, not used empirically, but in a manner as scientific and accurate as one would use any other drug in the materia medica. No one would think of prescribing digitalis and nux vomica without stating a definite preparation and a limited dose. So it is in the application of water; we should always prescribe the kind of bath to be used, the temperature of the same, and the length of time occupied in taking it. One can readily see the lack of care and judgment in ordering a cold bath without stating the temperature, when the water in summer may be 65° to 70°, and in winter down to 40°—considerable variations according to seasons.

Water possesses many properties which render it a very valuable medicinal agent. Its flexibility is shown by its change from solid to liquid, from liquid to vapor. It has the power of absorbing and transmitting heat, and its fluidity is such that it can be directed against the body in almost any form, as in the needle and shower bath; it can be made to strike the body in any direction from a hose pipe, in the form known as the douche; and it can exert equal pressure all over the body in the full bath. The amount of pressure in the douche form is regulated by means of air or the height of water in the tank; and when so applied, influences the vast network of nerves and blood vessels in the skin, giving a fine massage to each portion, and, when properly managed, the effect is enhanced by decided tonic reaction.

Hydrotherapy is not intended to treat all cases alone; there are other drugs which are useful in disease; both go together, and by their combined use, the physician is enabled to give his patient the full benefit of his professional skill.

We are always aware of the many uses to which water is applied for other purposes of cleanliness. Examples are numerous. Ice is applied to allay inflammation, externally and internally; to soothe an irritable stomach, the ice-cap and ice-bag are favorites in everyday use; boiling water and steam, as sterilizers in our surgical work; subcutaneous injections of

[1] Reprinted from the *Virginia Medical Semi-Monthly* of Feb. 8, 1901.

salt solutions, in hemorrhage and heart failure; warm-water irrigations of the genito-urinary tract, in cystitis, etc.; and alimentary tract in diarrhea and dysentery and in cases of nephritis, as a very useful diuretic, increasing the action of the kidneys better than any other drug in the form of a high injection. Hydrotherapy deals with all the forms, but it is chiefly concerned by the application to the skin; acting principally through reflex nerve action; its effects are largely due to the degree of heat and to the mechanical irritation kept up during the bath. The effects are observed in the circulation, respiration, temperature, tissue metabolism and secretion.

Circulation.— Cold water, when applied to the skin, at first causes a slight shivering and palor of the skin, due to the contraction of the coat of the peripheral blood vessels, sending the blood onward and producing a collateral hyperipheral with increased blood pressure. This peripheral contraction is followed immediately by dilatation dependent on the mechanical irritation applied to the surface, and due to the excitation of the inhibitory nerves; the collateral hyperemia stimulates the action of the muscular coats of the vessels beyond the point of irritation, and thus the blood is hurried along with increased volume and force toward the heart; here the effect on respiration shows itself; the respiration, at first shallow and deep, alternately spasmodic in character, soon adjusts itself, becoming deeper and slower. This enables the lungs to influence the circulation, and the ventricular contraction becoming slower and more forcible, peripheral dilatation has become evident, as is shown by tracings from the sphygmograph. We have then better circulation, better respiration, and better muscle tone.

All tissue change and all organic action depend on the amount of arterial blood in circulation, the activity of which enhances secretion and excretion. Following out these thoughts, and observing the bio-chemical changes, we find that there is increased consumption of O and increased elimination of CO_2. The total excretion of N is also increased, showing a better utilization of food, so also with urea and uric acid. The influence of baths on the excretion of N, urea, and uric acid is more marked after three or four days than at the beginning.

Where such increased activity is going on in the circulation and respiration, secretion and excretion, there must be corresponding activity among the cells of the body, and increased tissue change is the result; more work is done by the system, and there is a greater ability to do it.

To test the ability to do work after a cold bath, an instrument is used (ergograph) which registers the so-called fatigue curve. In this case it is considerably enlarged, and any person who cares to indulge in a cold bath after a day's fatigue will realize the new energy and life that he receives from it. A very noticeable feature of the effect of the cold bath on the blood is the change in quality; the number of corpuscles is very much increased, the white are two or three times their former number, and the red as much as one half more to two million per cubic millimeter; the hemoglobin is also increased. This lasts for a limited period of time after a single bath, the benefits last much longer, and finally become permanent, showing the value in cases of anemia, in wasting diseases, cachectic conditions, convalescents, and all those who are in a run-down condition.

Warm water acts similarly to cold, producing contraction of the peripheral vessels, followed by dilatation, with this difference, that it diminishes muscle tone and lowers arterial tension, while cold increases both. The influence of cold water on temperature is known to every physician, and how often does the restless and weary sufferer obtain a needed rest from it.

The antipyretic action of cold water in health is very limited, but is more marked in disease. As far as the passive application of cold water is concerned, it seems to have very little effect on temperature — it only succeeds in chilling the patient and delaying or entirely preventing reaction; and the colder the bath the less influence it has; but if a patient is treated with a moderately cold bath, and kept well rubbed while in it, the result is more satisfactory — the patient feels better, the pulse has a better tone, the temperature has gone down, reaction has followed. Here it is the mechanical irritation which does good, not so much the degree of cold.

There are very many methods in use which may be carried out in private

practice, and others which can be found only in institutions; and it is only in institutions properly fitted up with suitable appliances and well-trained attendants to carry out instructions, that the full benefits can be derived.

Let me enumerate some of the methods in use, beginning with the simpler and going up to the more intricate:—

The Ablution.— This consists in the application of water by the hand with gentle friction, not sponging simply, but aiding the stimulation by friction and producing a reaction. This is of value in acute fever,— anemia, chlorosis, phthisis, —and may be used as a preparatory step to other forms of bath.

The Half Bath.— The head is first wet, the patient placed in a tub of water up to the hips, with a temperature about 85° F.; then while friction is applied, water is dashed against the chest and abdomen.

The Affusion.— The patient may stand up or lie down, and water is poured over him from a bucket or other such vessel. Here the thermic and mechanical effects are combined, each acting as a powerful stimulant to cardiac action, respiration, assimilation, and nutrition. It is useful in cases of delirium and unconsciousness, the cyanotic condition due to hypostatic congestion, or poor contraction of the coats of the peripheral vessels. Winternitz speaks of its great use in collapse, heat stroke, etc., claiming that it is not the heart so much that is weakened as it is the collapse of the blood-vessels.

The Sheet Bath.— This is said to be excellent in cases of heat stroke and collapse. The drip sheet, the hot pack, the hip bath, can all be used intelligently in private practice. The hot pack is used in kidney troubles, relieving the pressure on the kidneys, and getting rid of the fluid in the tissues; these are combined with high irrigation in the colon. The bath, also called the sitz bath, is found to be excellent in all cases of diarrhea, summer complaint of children, pelvic disorders of women, ovarian trouble, menorrhagia, metrorrhagia; by increasing the time in the warm bath it allays the pain of the congestive forms of dysmenorrhea and inflammation. Of course, these baths are found in institutions, and with trained attendants it is only reasonable to suppose that the application and results would be very much better.

The Douche.— In institutions there are found other methods than those mentioned, notably the douche, in its variety of forms. The douche consists chiefly in the use of a piece of hose pipe, with a nozzle from one-sixteenth to one inch in diameter, giving a fine or coarse stream of water. This is called the jet douche. By placing the finger partly across the lumen of the nozzle we get a fan douche; then there is the rain douche, or the shower bath; and the circular douche, or needle bath; there is also an ascending douche, which strikes the patient from below. For the better application of this douche, a table is made, shaped somewhat like a box, about four feet high, and a top four feet by three, with stop-cocks marked for the different douches; the shower, needle, jet. Hot and cold water pipes are fitted with thermometers to regulate the degree of heat of the bath. The temperature of the bath can be raised or lowered at will, and the pressure of the jet is regulated by a gauge, so that a pressure of ten, fifteen, twenty, thirty, or forty pounds to the square inch can be obtained. With such arrangements as these you can recognize the immense use to which the douche can be applied. One attendant is sufficient. He has but little work to do except to direct the jet and regulate it according to directions. It is certainly a therapeutic weapon of great value for good, and can be graded to suit anyone, from the robust and hearty to the delicate and sensitive.

This form of treatment is very popular in France and America; not so much in Germany. It affords a very liberal range for grading the temperature of the bath from 110° to 50° F. Its application at a lower temperature should never exceed one minute, and generally varies from twenty to thirty seconds; in fact, the lower the temperature and the shorter the duration, the greater the reaction. It works easily, and is passed rapidly from one part to another in succession. In order to make the skin more sensitive to the action of the douche, the patient is often put in the hot-air cabinet to warm up, not to perspire, or is given a dry pack prior to the application of the douche. Some individuals, owing to fear or nervousness, are unable to stand the douche at first. These patients have to be educated by other modes of procedure, such as the cold rub or the gradually cooled bath, until they become accustomed to

the effect of cold. Generally, though, if the douche is given first at a temperature of 95° to 100°, and reduced one to two degrees daily, then it is very well tolerated by even the most sensitive. You must inspire the patient with confidence in the method, and gradually enable him to stand the force of the douche.

The douche is found to be very effective in cases where there is depreciated nerve tone, lack of energy and muscular power due to poor nutrition, chronic dyspepsia, chronic rheumatism, neurasthenics, enuresis of children, anemia, chlorosis, menorrhagia, metrorrhagia, and in all forms of ill health due to the effects of fashionable society and its round of pleasures, or to the overwork of the diligent business man or untiring student.

In prescribing these baths, we ought always to begin with a mild dose, so to speak, and gradually increase to suit the requirements of the patient. The temperature, pressure, and duration should be strictly regulated, as for example: temperature, 95° to 85°; pressure twenty-five pounds; duration, fifteen seconds. You can readily understand the great leeway there is in the temperature, but the pressure is something that is better appreciated when the effect is seen. A pressure of twenty-five pounds from a jet douche will redden the skin wherever applied, but one of ten pounds will hardly show a trace. In people who are emaciated and cachectic, even when the skin has been stimulated previously by hot air, it takes a high pressure to produce the same or nearly the same effect. The duration is exemplified by putting one hand in cold water (ice water) and immediately withdrawing it; soon it reddens, grows warm, and feels quite pleasant. Put the other hand in for five minutes; it pains, grows cyanotic, and takes quite a while for a reaction to occur. You can now judge for yourselves of the value of prescribing accurately and scientifically the temperature, pressure, and duration of a douche bath.

Baths of sodium chloride and calcium chloride, one per cent of the latter, gradually increased to three times the amount of each, and then made effervescing by the addition of enough soda and hydrochloric acid in proportion, lasting from six to eight minutes, and beginning with a temperature of from 92° to 95°, and gradually lowering the temperature and lengthening the duration, — this is an artificial Nauheim bath, which, when followed by a series of exercises or Swedish movements, is known as the Schott treatment for weak hearts, hypertrophy, and dilatation.

The exercises consist of a series of movements for each limb (made against a slight resistance), extensions, abductions, adducitions, and rotations, with a rest after each one; there must be no breathlessness nor any discomfort; every muscle is brought into play, slowly and systematically.

The effect of the bath and exercises are similar; pulse frequency is diminished, volume and force are increased, the area of cardiac dullness is lessened, the apex beat approaches the normal position, indicating improvement in the contractile power of the heart and reduction of the dilatation. Each succeeding bath gives a longer time in which this improvement is maintained until at last it remains so permanently.

Schott's idea is that it is the reflex stimulation which makes the contraction more forcible and complete, and when frequently applied, enables hypertrophy to follow and overcome the effect of the valvular lesion or the atonic condition of the heart. It seems probable that it also gives rise to a physiological dilatation of the peripheral blood vessels, thereby lessening the resistance to the already weak heart.

The exercises propel the blood onward through the veins, making a transfer of the blood from the venous to the arterial system, — the reverse of what usually occurs in heart disease. They are found to be useful in dilatation after acute diseases; in eruptive fevers, typhoid, influenza, pneumonia, rheumatism, and gout; in functional and neurotic heart disease; in mitral disease, especially stenosis where compensation is maintained with difficulty, and where digitalis, by increasing the contractility of the right ventricle, might prove harmful. Wherever compensatory hypertrophy shows signs of failure, it is plainly indicated, and the treatment, of course, is better undertaken away from home, where the uneventful life, early hours, regular meals, freedom from excitement and care, contribute to the success.

These baths are given every day for four or five days, followed by a day of rest, and ought to be continued for four or five weeks; the effervescent baths begin after two weeks of the salt baths.

Dr. Oliver shows that the blood, after the exercise, goes to the muscles, and that the arm, after exercise, displaces a larger volume of water; also that the corpuscular elements increase, which he attributes to the absorption of the fluid elements by the muscles and lymphatics. Experiments by Brunton and Tunnicliffe show that muscular exercise at first raises and then lowers the blood pressure.

Resisting movements are especially adapted to persons with flabby hearts, with fatty infiltration and loss of muscle tone; in chlorosis; in commencing heart failure; in chronic valvular disease, with rest from all other exercises; and when digitalis seems not to be able to finish up the case, in atheromatous diseases of the coronary arteries, characterized by a degree of plethora, some dyspnea, and cardiac pain on exercise.

Schott claims that only two cases of heart disease are contraindicated to this kind of treatment; viz., aneurism, and some, not all, cases of progressive arteriosclerosis. These baths are also used in other diseases, such as rheumatism and gout, with high arterial tension and secondary heart disturbance.

I am indebted to the following authors for much information: Baruch, on Hydrotherapy; Baruch. in International Clinics, Vol. II, Series VII; Thayer in Hopkins Report; Schott, on Baths; Oliver, in Croonian Lectures; London *Lancet*.

Poisoning from Autointoxication. — Dr. T. D. Crothers, in an article which appeared in the April 27th number of the *Journal of the American Medical Association*, emphasizes the following facts: 1. Alcohol in any form, taken into the body as a beverage, is not only a poison, but produces other poisons, and associated with other substances may develop toxins. Alcohol is also an anesthetic and not a tonic or so-called stimulant. It increases the waste products of the body, and diminishes the power of elimination. It also destroys the phagocytes of the blood, and thus removes and lessens the protective power of the blood cells. 2. Whenever alcohol is used continuously as a beverage, for its medicinal effects, favorable conditions and soils for the cultivation and growth of poisoned compounds are created. These may be neutralized by other conditions, and not be apparent in the derangements of the functional activities which follow. Where disturbance and derangements of the nutrient and functional activities of the body are associated with the use of alcohol, their character and disappearance by the removal of spirits suggest the cause. 3. The functional and organic symptoms of derangements appearing in those who use spirits in moderation or excess, which quickly disappear by abstinence and eliminative measures, are clear indications of self-intoxication from this source. Obscure symptoms of the nervous system in persons who use spirits should always be examined in relation to the toxic origin from this source. Also grave nutrient disturbances should suggest the same cause, with the same treatment. 4. The treatment of all such cases, in which alcohol is used in any form, should be by antiseptic and eliminative measures, and the supposition should always include the possibility of poison by chemical products formed in the body.

Obesity and Its Treatment. — Dr. Strebel, in addition to the well-known dietary prescriptions, contributes some interesting details to the treatment of this obstinate condition. He adds the electric light to the usual procedures. Hot-air baths constitute one of the best means of keeping the conditions in check, but it is only too frequent that precordial distress, palpitations, syncope, and vomiting are induced by this means; certain patients with heart trouble can not take such baths. For such especially are the electric-light baths available. Among the gymnastic exercises advised by the author is the familiar one of resting on one's back and coming to the sitting posture. This should be done regularly ten to twenty times at a séance, once or twice a day, on rising and retiring. As a cardiac tonic he recommends camphor, preferably in oil, used hypodermically. The electric-light séances are to be carried out twice a week. After an exposure of twenty minutes to an arc light, the neck is enveloped in cold compresses, and after the séance a bathing at a temperature of 86° F., followed by five minutes at 64° F., then massage and friction.—*Deutsche medicinische Zeitung, 1901, No. 3, S. 28; American Journal Medical Science, May, 1901.*

TRANSLATIONS AND ABSTRACTS.

[THE articles in this department are prepared expressly for this journal.]

THE REPORT OF THE ANESTHETICS COMMITTEE OF THE BRITISH MEDICAL ASSOCIATION.

THIS noteworthy contribution to our knowledge of the subject of anesthesia and the comparative value and safety of the various general anesthetics, is the result of nine years' work on the part of a committee of twenty-one members of the British Medical Association, appointed in 1891, and having as members such worthy representatives of British surgery as Lord Lister, Professor Mc Ewen, and Professor Ogston. The committee was appointed "to investigate the clinical evidence with respect to the effect of anesthetics upon the human subject; and especially the relative safety of the various anesthetics, the best methods of administering them, and the best methods of restoring a patient in case of threatened death." The subcommittee to which this work was deputed, and of which Mr. Hutchinson was chairman, instituted an inquiry which extended over the year 1892, into all cases of the administration of anesthetics in the United Kingdom of which accurate notes could be obtained, and these records were carefully classified and subjected to a most exhaustive and critical analysis. Detailed reports were secured upon 25,920 cases, and the enormous amount of work required in the careful analysis of this enormous amount of material may be imagined.

In 13,393 cases, chloroform was the anesthetic; in 4,595, ether; in 2,071, nitrous oxide, followed by ether; in 678, A. C. E. mixture; in 418, mixtures of chloroform and ether in various proportions; in the remainder, various combinations of chloroform, etc.; but it would seem that every possible permutation of these anesthetics and their mixtures had been employed to make up the number of methods investigated to 45.

Of the total number of cases analyzed, 25,163, or 97.169 per cent, are classed as uncomplicated cases, or those in which, as far as the effects of the anesthetic are concerned, nothing unusual occurred. The percentage of uncomplicated cases of chloroform anesthesia was 96.73, and of ether, 96.953. Of the complicated cases, in 68.57 per cent of the ether cases and 45.2 per cent of the chloroform cases, the complications were of a minor character, and not such as to cause anxiety. Out of the 13,393 cases of chloroform anesthesia, 138 cases are classed as cases of danger, and of these 120 recovered and 18 died. The percentage of the cases of danger to the total percentage of chloroform anesthesia was then 1.03. Of the 4,595 cases of ether anesthesia, there were 14 cases of danger, and of these 8 recovered and 6 died. The percentage of "danger" cases was then to the total ether cases 0.304. This percentage was smaller than that of the various combinations and mixtures, in which, although in some the total number of cases were too small to make the statistics of value, the percentage of "danger" cases ranged from 0.338 to 4.347. There were 29 cases of death due or partly due to the anesthetic, of which 17 occurred under chloroform, 6 under ether, and 6 under other combinations and mixtures.

The analysis with reference to the time of year shows that the percentage of complicated and danger cases was slightly greater in the winter than in the summer months. And that this increase of danger was slightly greater in the case of ether than of chloroform.

The percentage of complicated cases in all anesthetics was greater in males than in females in the proportion of 1.477 to 1, and the percentage of danger cases in the ratio of 1.687 to 1. In males the percentage of danger cases under chloroform was nearly six times that under ether, while in females it was nearly twice the percentage under ether. In males the frequency of danger cases under chloroform was 1 to every 68 administrations; under ether, 1 to 406 administrations. In females under chloroform the danger cases were 1 in every 141 administrations, and under ether, 1 in every 251 administrations.

The analysis with reference to the condition of the patients at time of operation, emphasizes the higher danger rate of chloroform in healthy patients. Adding together the cases in which chloroform was used alone or in mixture, a total is obtained of 10,199 patients in healthy condition with 73 cases of danger, 0.716

per cent. The danger rate in patients in good condition under ether was only 0.135 per cent, or less than one fifth as great. The exact figures for ether were 5,200 cases, with seven danger cases. In patients in poor or very bad condition, the danger rate was still higher with chloroform than with ether, but not in so high a proportion.

The analysis of the various pathological conditions as affected by anesthetics brings out many interesting facts, to only a few of which we have space to refer. In valvular disease of the heart, the only three cases of danger occurred under chloroform, giving a danger rate of 4.61 per cent for this anesthetic in valvular disease. In tuberculosis, including phthisis, the general danger rate was diminished for all anesthetics, especially ether, while the danger rate for chloroform was less than half the general chloroform danger rate. "Anesthesia in pulmonary phthisis is remarkably free from complications and dangers throughout the whole of the record books." In bronchitis the liability to complications is largely increased and the danger rate more than five times increased under chloroform. In empyema the general chloroform complication rate was high, but there were so few cases of this disease where other anesthetics were given, as to offer no grounds for comparison. In alcoholism, chloroform was found more than eight times as dangerous as in the general run of cases, while in the 56 cases in which ether was employed there were no cases of danger.

To summarize the conclusions on pathological conditions: There was found increased liability to complications and dangers in patients suffering from emphysema, shock and collapse, alcoholism, affections of the heart, emaciation, empyema, bronchitis and anemia. Symptoms of danger were particularly prone to arise under chloroform, in emphysema, shock and collapse, alcoholism, diseases of the heart, valvular and otherwise, and empyema.

Many more deductions of interest and value might be cited from this exhaustive and extremely thorough report, but space will allow us the consideration of only a few of the more interesting of the final conclusions of the committee. The following are of special importance: —

1. *Relative Safety of the Various Anesthetics.* — The cases of danger under the chloroform group of anesthetics, considered to be entirely due to the anesthetic, were 88, or 0.584 per cent. Under the ether group of anesthetics there were only 6, or 0.085 per cent. Ether must, therefore, be accepted as the safest routine anesthetic, though certain circumstances connected with the nature of the operation, the state of the patient, etc., may make the use of some other anesthetic or combination safer and easier.

2. *Methods of Administration.* — No method of administration of chloroform is free from danger, but the occurrence of danger depends largely upon the administrator who follows any particular method.

3. *Regarding Chloroform and Ether.* — In conditions of good health, chloroform is very much more dangerous than other anesthetics.

4. When danger occurs under chloroform, there is abundant evidence that in a large proportion of cases the symptoms observed are those of primary circulatory failure.

5. While respiratory complications are, as a whole, of equal frequency under the ether and chloroform groups respectively, yet those which occur under ether are, for the most part, of a trifling and transitory nature, while those that occur under chloroform are most grave and persistent.

6. While vomiting is more common after administrations of ether, severe and prolonged vomiting is more common when chloroform has been used.

The above are only a few of the interesting and important conclusions arrived at by the committee, a report which may be said to have settled beyond peradventure the relative safety of ether as a routine anesthetic. It will be interesting to note whether it will have any effect upon British practice, or whether chloroform will still maintain its hold.

The results of this laborious clinical analysis and comparison tally very closely with those of physiological experiments, by which repeatedly the limit between the safe and toxic dose of ether was about seven times as great as in the case of chloroform, thus conclusively proving that the former was about seven times as safe an anesthetic for ordinary purposes. — *Boston Medical and Surgery Journal.*

Tobacco As a Factor in Glycosuria. — In a paper on this subject which appeared in the April 27th number of *The Medical Record*, Dr. Heinrich Stern states that the use of tobacco increases the amount of glucose found in the urine of patients previously suffering from this disease, and that the condition is brought about as follows: (1) By protracting the duration of transient glycosuria, and by imparting to alimentary mellituria a certain degree of chronicity; (2) by increasing the quantity of deatrose in twenty-four hours' urine, in the transitory as well as in the chronic forms of glycosuria; (3) by transforming the lighter degrees of chronic glycosuria into the graver forms. These results, the author attributes in a measure to the presence of carbon monoxide in the fumes of tobacco, it being a product of imperfect combustion.

Concerning the Antiphlogistic Action of Cold Applied to Points Distant from the Seat of Inflammation.— Emmert (*Fortschritte der Medicin*, 1901, xix., p. 161) in Goldscheider's clinic, has repeated some experiments which were made by Samuel in 1892, with regard to the antiphlogistic action of cold applied at points distant from the seat of the inflammation. Samuel noted that if croton oil were applied to one ear of the rabbit, while the other was immersed in water, the inflammation was materially delayed. In control rabbits the process came on in five hours, while in those in which the opposite ear was immersed, no signs of inflammation were to be noted throughout the experiments, which lasted up to twelve hours. On removing the ear from the water, however, the inflammation began. Samuel's explanation of this antiphlogistic action was, that owing to cooling of an extensive vascular area, the leucocytes which passed through the vessels were, for a certain length of time, deprived of their active motility. In repeating Samuel's experiments, Emmert adopted a somewhat different plan, as he found it difficult to keep the rabbit's ear under water for long periods of time without bringing about conditions which interfered with the experiment. An arrangement was made by which without much distress to the animal, one leg could be kept under water. It was found that under normal circumstances the time at which the evidences of inflammation set in, varied so greatly that it was necessary to retain the leg under water for at least twelve hours, by which time, in the control animals, the inflammation invariably came on. The experiments showed that, by immersion of the lower half of the left hind leg in water at a temperature of from 12° to 15° C., the croton oil inflammations were delayed as long as the leg remained in the water. Some of the experiments were continued as long as thirty hours. Another series of experiments, in which the leg was immersed after the inflammation had begun, showed distinctly that the inflammatory process stopped at the point which it had reached at the beginning of the bath.

With regard to the explanations of this phenomenon, Emmert differs from Samuel. He noted, contrary to the observations of the latter, that the temperature of the animal always fell several degrees, and that this fall in temperature always preceded the disappearance of the inflammatory process. It was found, further, that if, while the leg was still in the bath, the animal was warmed so as to prevent this fall of temperature, the inflammation occurred exactly as in the control animals. In another animal exposed simply to cold air there was also a marked fall of temperature and a material delay in the onset of the inflammation. He concludes that the observation of Samuel, that the immersion of one extremity of a rabbit in a cool fluid is sufficient to hinder the development of a croton oil inflammation in another part, is true; that, indeed, the antiphlogistic action of this procedure is even greater than Samuel suspected. Emmert's experiments, however, appear to show that the delay and prevention of the croton oil inflammation depends not upon any special action of the cold on the leucocytes in the exposed area, but upon the marked fall of temperature throughout the animal's whole body.—*American Journal of Medical Science, May, 1901.*

The Spinal Origin and Nature of the Vasodilator Fibers of the Hind Limb.— Wm. Bayliss (*Journal of Physiology*, Vol. XXVI, Nos. 3 and 4, Feb. 28, 1901), after a number of elaborate experiments carried on for the purpose of locating the spinal origin and the nature of the vasodilator fibers of the hind limb,

has summarized his conclusions as follows: —

1. There are nerve fibers in the posterior roots of the fifth, sixth, and seventh lumbar and first sacral nerves, excitation of which, when cut away from the spinal cord, gives rise to vascular dilation in the hind limb of the same side. The excitation may be either electrical, mechanical, chemical, or thermal, and of these, mechanical excitation is most effective.

2. These fibers do not pass into the abdominal sympathetic chain, and therefore must proceed directly into the lumbosacral plexus.

3. They do not degenerate when cut between spinal cord and posterior root ganglion, hence they are not spinal efferent fibers. They do degenerate when posterior root ganglia are extirpated, hence their "trophic centers" are in these ganglia.

4. They are, in fact, identical with the ordinary sensory afferent posterior root-fibers; the name "antidromic" is suggested for the process by which nerve-fibers convey impulses in a direction contrary to that assumed by the Bell Majendie law, when such impulses produce effects in the organs at the origin of such fibers, *e. g.*, when afferent fibers excited at their ends in the central nervous system produce vascular dilatation at their peripheral ends in the tissues of the body.

5. There is no evidence that the hind limbs receive vasodilator fibers from any sources other than the above-named posterior roots.

6. There is a certain amount of evidence tending to show that these fibers are excited, antidromically, in reflex vascular dilation of the hind limb, but further work is necessary.

7. It is doubtful whether there is normally any considerable amount of tonic excitation of vasoconstrictors of the hind limb, and, this being so, reflex vascular dilation must be produced chiefly by excitation of vasodilators, and only to a small degree, if at all, by inhibition of vaso-constrictor tone.

8. Voluntary muscle is too scantily supplied with vasodilator nerves for these to have any importance in the functional activity of the tissue.

9. The vasodilators of the fore limb of the dog are situated in the posterior roots of the sixth, seventh, and eight cervical, and first thoracic nerves, perhaps to a small amount also in that of the fifth cervical.

10. Vascular dilatation has also been obtained in the hind limb of the cat by exciting the posterior roots of the sixth and seventh lumbar nerves.

Surgical Analgesia by Spinal Cocainization.— Fowler (*Annals of Surgery*, December, 1900), in discussing the applicability of this method in ordinary surgical practice, points out that in prolonged operations in regions below as well as above the seat of puncture, and in all operations whether of brief or long duration above this seat, it will still be found necessary to have recourse to ether or chloroform. Spinal cocainization, it is held, if properly and carefully practiced, is free from special risk. No deaths, the author asserts, have yet been definitely reported from trustworthy sources, although it is a well-known fact that such have occurred where simple lumbar puncture has been made for diagnostic purposes. The action of the drug, he holds, must be largely discounted in estimating the risks of the procedure. The risks of inflicting mechanical injury are regarded as insignificant. There is only a remote possibility of the needle's piercing the nerve structures, and even should these structures be invaded, it is highly improbable that serious damage will be inflicted, as much more important nerves, and even parts of the central nervous system have repeatedly been explored by the needle without the slightest indication of consequent disturbance. The risk of septic complications following the puncture and injection, is certainly a serious one, and indicates the necessity of very careful aseptic precautions.— *British Medical Journal, February 2, 1901.*

Olive Oil for Gall Stones.—Witthauer reports a case in which 137 stones were passed by a patient to whom olive oil was given daily in doses of from twelve to sixteen ounces. When the patient could no longer tolerate the oil by the stomach, it was administered by the rectum.

A Bequest for a Worthy Cause.— The late Dr. Chas. Dana, of Tunkhannock, Pa., left the sum of $2,000 to be used for furthering the cause of temperance, and aiding prohibition.

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

The Bacteriology of Ozena.—Many organisms in addition to the bacillus mucosus of Lowenberg and Abel, have been credited as the cause of ozena. Stein (*Centralb. f. Bakt.*, Bd. xxviii, Dec. 15 and 20, 1900) has bacteriologically examined the nasal secretions of eighty-six patients, fifty-one of whom were the subjects of ozena, and the other thirty-five were either healthy or suffering from other diseases. Abel has drawn attention to the infectious character of the disease, the frequency with which it is found in more than one member of the same family, and the progress to the neighboring organs as a process of autoinfection. The disease is very insidious in its commencement, the first symptoms attracting the patients' attention being often some nasal obstruction and a disagreeable smell. Stein relates the histories of a mother and two children in whom the infectious nature of the disease was well illustrated. The parts most commonly affected secondarily, are the middle ear and the larynx. In one case, where the disease spread from the left to the right nostril, Stein was able to study the early changes. The mucous membrane was swollen and reddened, and scattered over it were small, round foci about the size of a lentil, consisting of muco-fibrinous material, and containing the B. mucosus in pure culture. In his investigations the author has classed all cases as ozena in which the characteristic secretion and the atrophic signs were present, irrespective of the presence or absence of fetor. The latter must be considered secondary. Excluding organisms found in healthy noses, and those found very rarely in the cultures, two types were frequent, the B. mucosus and a bacillus resembling the B. diphtheriæ. The gonococcus believed by Stork to be a common cause of the disease, was not found. The bacillus resembling the B. diphtheriæ is identical with that described by Belfanti and Della Vedova as a cause of the disease, but it is again identical with a certain organism frequently found in the secretion from healthy throats and noses; except for its possessing no pathogenic properties, it closely resembles the B. diphtheriæ. It was not present in twenty-six out of fifty-one cases of ozena, and can not be considered the cause of the condition. The organism described by Perez is considered by Stein to be one of several which are concerned only in the production of the fetor secondary to the real pathological process. With regard to the bacillus mucosus, it was found in forty-four out of the fifty-one cases of ozena. Of the seven negative cases, five were examined only once, and in three of these a bacillus resembling the B. mucosus was found microscopically, but not the culture. In the other two cases, forms considered as in all probability involution forms of the bacillus were found. Stein considers it in the degree probable that this organism is the real cause of the disease; it is not the cause of the fetor, for pure cultures do not exhibit the characteristic smell. The opinion of Bayer, that the disease is originally a trophoneurosis is discussed, also that of Cholewa and Cordes, who, although they consider that the B. mucosus is inseparably connected with the disease, do not accept its causal relationship, and believe the first changes to occur in the bones, and to be of the nature of osteomalacia. Stein considers that his researches, combined with those of Abel, argue that the disease is an infective process dependent on the activity of the bacillus mucosus.—*British Medical Journal, April 6, 1901.*

The Bacillus of Articular Rheumatism.—The bacillus which Achalme described in 1891 is probably, as a rule, an ordinary saprophyte. Under the influence of fatigue or cold, the blood becomes favorable for its development, and it passes by way of the circulation to the heart muscle, where it locates, the activity of the muscle furnishing it with the culture-medium it prefers. It may propagate in the serous membranes of the endocardium and in the pleura, even before the articular manifestations. The latter, by their symmetry, their mobility, and their occasional sudden disappearance with complete restitution, indicate that they are not directly microbian, but are due to the toxins generated by the bacilli ensconced in the primary focus, the heart muscle. There is a sort of eruption on the syno-

vial membranes consecutive to the carditis, like the sore throat of scarlet fever. The carditis may exist without articular complications. The bacillus causes an actual process of putrefaction in the living tissue, the products of which are probably amido-acids, as *in vitro*. Sodium salicylate combines with the most important of this group, glycocol, and is eliminated as salicyluric acid. This fact suggests an explanation of its heroic action in acute articular rheumatism as well as in other non-infectious rheumatic manifestations. The bacillus is of the same size and shape as the anthrax bacillus and the septic vibrio. It is anaerboic, takes the Gram and the Claudius stains, and requires a temperature above 21° and below 45° C. The sporulation is ovoid; not so terminal as that of the tetanus bacillus. It grows on milk with productions of gas, and coagulates into a small clot, pitted with holes from the action of the bubbles. It induces an acid fermentation at the expense of the carbohydrates, but never sporulates in an acid medium. If a rabbit is inoculated with 2 c.c. of a culture of the bacillus, it usually dies in four or five days with serous effusions in the pleura and pericardium, but it is impossible to find any of the micro-organisms in the fluids or tissues. A smaller dose kills a young rabbit in thirty-six to forty-eight hours, with a pronounced infection of all the organs. The results of bacteriological examination of patients are positive in some cases and negative in others, but before accepting the negative findings, milk or bouillon should be copiously sown with small cubes from the myocardium. — *P. Achalme, Gazette Médicale de Paris, April 6; Jour. Am. Med. Assoc., May 4, 1901.*

Bacteria in Sterilized Milk. — Dr. A. Weber has carried out a series of investigations on the sterilized milk of commerce, and his results are embodied in a paper which was published in the *Arbeiten aus dem kaiserlichen Gesundheitsamte*, 1900. The disadvantages of sterilization were found to be: (1) An alteration of the albumins; (2) the aggregation of fat globules; (3) loss of CO_2, thereby altering the taste of the milk; (4) caramelization of the lactose; and (5) decomposition of the lecithins. These changes resulted in an impairment of the nutritive value of the milk, largely owing to decreased digestibility, and though but slightly marked in milk which had been sterilized for only fifteen to twenty minutes, the changes rapidly became more pronounced when the sterilization was prolonged beyond that limit. But the so-called "sterilization" of twenty minutes' duration Dr. Weber found was not effectual, and it was not until it was prolonged an hour or more, by which time the changes were visible to the naked eye, that the milk was really sterile. From his experiments, Dr. Weber found that ordinary dairy milk is never free from bacteria — a fact which is universally admitted. Dealing as he did with sterilized milk obtained from various sources, he found that the milk was really sterile in from five to eighty-six per cent of the bottles obtained from the sterilizing stations. The bottles used were of the kind, now familiar, provided with a stopper, having an India rubber ring, and a string attachment. His method of testing the milk was, on receipt of a specimen, to shake it, before unstoppering, to obtain the "sound test." The bottle was then placed in the incubator for periods varying from one to sixty-seven days; in other words, the milk was incubated anaerobically. After the lapse of a certain time, the milk was subjected to the heat and alcohol tests for clotting. His results showed that the best-looking and best-testing milks were the worst bacteriologically. In each hundred samples examined, fifty-four remained sterile, six clotted on heating, eighteen were clotted by the addition of alcohol, four stood both tests, but were not sterile. The paper includes a description of the morphological appearances and cultural reactions of many of the bacteria isolated during the course of the investigation, and not the least valuable part of the paper to workers in the same field is the very full bibliography of German literature appended. — *British Medical Journal, Jan. 19, 1901.*

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HIPPOCRATES ON HYDROTHERAPY.

THAT Hippocrates made large use of water in the treatment of disease is clearly evidenced, not only from his own writings, but from the writings of his contemporaries. The following paragraphs, which I quote from the "Genuine Works of Hippocrates," pages 252, 253, contain many sagacious hints regarding the employment of this valuable remedy:—

"The bath is useful in many diseases. In some of them when used steadily, and in others when not so. Sometimes it must be less used than it would be otherwise, from the want of accommodation; for in few families are all the conveniences prepared, and persons who can manage them as they ought to be. And if the patient be not bathed properly, he may be thereby hurt in no inconsiderable degree; for there is required a place to cover him that is free from smoke, abundance of water, materials for frequent baths, but not very large, unless this should be required. It is better that no friction should be applied, but if so, a hot soap smegma must be used in greater abundance than is common, and the affusion of a considerable quantity of water is to be made at the same time and afterward repeated. There must also be a short passage to the basin, and it should be of easy ingress and egress. But the person who takes the bath should be orderly and reserved in his manner, should do nothing for himself, but others should pour the water upon him, and rub him, and plenty of waters, of various temperatures, should be in readiness for the douche; and the affusions quickly made; and a sponge should be used instead of the comb strigil, and the body should be anointed when not quite dry. But the head should be rubbed with the sponge until quite dry; the extremities should be protected from cold, as also the head and the rest of the body; and a man should not be washed or bathed immediately after he has taken a draught of ptisan or a drink; neither should he take ptisan as a drink immediately after bath. Much will depend upon whether the patient, when in good health, was very fond of the bath, and in the custom of taking it: for such persons, especially if they feel the want of it, and are benefited if they are bathed, and injured if they are not. In general it suits better in cases of pneumonia than in ardent fevers; for the bath soothes the pain in the side, chest, and back; concocts the sputa, promotes expectoration, improves respiration, and allays lassitude; for it soothes the joints and outer skin, and is diuretic, removes heaviness of the head, and moistens the nose. Such are benefits to be derived from the bath, if all the requisites be present, but if one or more of these be wanting, the bath, instead of doing good may rather prove injurious; for every one of them may do harm if not prepared by the attendants in the proper manner."

THE RATIONAL TREATMENT OF PERNICIOUS ANEMIA.

A CAREFUL study of a considerable number of cases of pernicious anemia which have come under our observation, have led us to some very definite conclusions respecting the cause of this disease. The etiology of pernicious anemia has been generally looked upon as a sort of *terra incognita*. Eminent teachers of pathology assure us that nothing is known

respecting the origin of this malady; that all we know of it in fact is, that while temporary improvement may be secured by various measures, the disease is practically incurable, being certain to return sooner or later. The writer's observations have led him to take a decidedly different view of this malâdy. Within the last few years a number of cases of this sort have, under the medical care of the writer and his colleagues at the Battle Creek Sanitarium, been brought to a successful issue by treatment based upon the belief that the disease is one of faulty nutrition, with a primary defect in the chain of nutritive processes located in the stomach.

The following illustrative case I observed in connection with Dr. Chas. E. Stewart: Mr. R. A. W., of Michigan, an insurance agent, aged thirty-two, applied for treatment Jan. 13, 1900. The patient's mother died of some form of paralysis, and his father had frequent attacks of rheumatism. Mr. W. had the ordinary diseases of childhood, but was considered robust until sixteen, from which time until he was nineteen, he had fainting spells at irregular intervals, during which he would be unconscious for two or three minutes. From the age of nineteen, he enjoyed good health. About four months ago he began to have distress in the region of the stomach, especially after eating. He vomited on an average of once a week, the vomitus consisting of undigested particles of food, mucus, and bile. Potatoes, cabbage, and other coarse vegetables were particularly distressing, and almost invariably produced emesis. His bowels were chronically constipated.

A physical examination revealed a man whose general development was good, body symmetrical and well-rounded, muscles flabby, skin atrophic and of a lemon-yellow color. The patient had observed this color for a month previous to his coming to the Sanitarium for treatment. Teeth in very good condition; tongue large, flabby, coated, and teeth-marked, mucous membrane of lips and mouth anemic. Eyes of a peculiar pearly color. A hernic murmur was distinctly audible at the base of the heart, extending some distance into the neck. Heart dullness slightly increased. Patient complained of palpitation at times. The stomach was dilated and prolapsed, the greater curvature extending one inch below the umbilicus. Spleen slightly enlarged. Superficial and deep reflexes normal.

The result of a bacteriological and chemical examination of the stomach contents after a test meal consisting of 1 ounce of granose, 8 ounces distilled water, and 8 grains of sodium chloride, was as follows:—

Number of microbes per c.c. of stomach fluid, aerobic 180,000, anaerobic 635,000.

Total acidity.....	.006	grammes.
Calculated acidity.....	.304	"
Total chlorin.....	.320	"
Free HCl.....	.000	"
Acid combined chlorin...	.002	"
Neutral combined chlorin.	.302	"
Total combined chlorin..	.304	"
Fixed chlorides.....	.016	"

Frequent examinations of the urine showed it to be normal in amount and specific gravity.

The relation between the urea and total solids was also practically normal. In about 40 per cent of the sixteen examinations of urine, from a trace to 2 per cent of albumen was found.

A microscopic examination of the blood the second day after the patient's arrival, showed 66 per cent of red blood cells, 93 per cent of hemoglobin, and 100 per cent of white cells.

During the first month of the patient's stay with us, his blood was examined twice each week, and from the observations made, it was evident that he was rapidly developing a grave form of anemia. By this time the percentage of red blood corpuscles had dropped to 35 per cent, and the hemoglobin to 50 per cent. It was also observed that there were numerous

poikilocytes and lymphocytes present, as well as a few nucleated red blood cells. During the remainder of the patient's stay, which was about six months, daily examinations of the blood were made. The microscopic and macroscopic appearances at the end of the first month, with the physical signs, presented a clear picture of a case of rapidly developing, pernicious anemia.

The number of red blood cells and hemoglobin continued to rapidly decrease until the number of red blood cells reached 400,000 per c.m. and the hemoglobin 11°, by Fleichel's instrument. A differential count of the blood cells showed a diminution in the number of polymorphonuclear cells, an increase in the number of lymphocytes, and eosinophiles and that a few myelocytes were present.

A macroscopic examination of the blood showed it to be pale and watery. When dropped on a flat surface, the watery portion spread out, and the coloring matter was drawn to the center. While the blood count was so low, the patient frequently complained of indescribable nervous sensations, in different parts of the body. At times he was unconscious. It was only with great difficulty that he could carry on a conversation: his mind became easily confused, and his speech was slow and thick. He could not raise his head from the pillow, and the least exertion would cause him to faint.

From this time on the patient's condition rapidly improved, and in five weeks from the time of the lowest blood count—400,000 per c.m.—the number of red blood cells had increased to 4,750,000 per c.m., and hemoglobin, 105°, white blood cells 100°; no poikilocytes were observed. The diameter of the red blood cells, however, was greater than normal.

At this time the patient was in comparatively good health, being able to participate in outdoor games such as croquet and tennis. He left for home six months after his arrival, feeling much better. A letter received from him six months after his departure, conveyed the intelligence that he was in quite good health, and was able to carry on his office work.

This case will be fully reported by Dr. Stewart in a future number of this journal.

A number of other similar cases might be reported. In all these the antiseptic properties of fruit were largely relied upon as a means of cleansing the infected stomach, and meat products of all kinds were strictly excluded from the patient's dietary, for the reason that flesh foods, meat extracts, and even beef tea furnish excellent culture media for the pathogenic organisms upon which it is believed this disease very largely depends.

Hunter published last year, in the London *Lancet*, a series of papers in which he calls special attention to the relation between the teeth and pernicious anemia. He has convinced himself that decaying teeth and suppurating gums are sufficient to cause pernicious anemia by promoting the development of germs. These germs colonize in the stomach, producing gastric catarrh, and giving rise to ptomains which, when absorbed, give rise to the marked diminution in the blood corpuscles characteristic of this disease. Hunter insists on the removal of all infected teeth, the disinfection of the mouth, and chemical antiseptics of various sorts for the stomach. But he seems to have missed what appears to us to be the essential point in this disease, viz., the dietetic method of disinfecting the stomach and building up the blood by introducing a large amount of the purest and most digestible nutrient material.

Various hydriatic methods, especially the cold precordial compress for a few minutes, at intervals of two or three hours during the day, cold mitten friction, cold towel rubs, light massage, and other measures are calculated to improve the general blood movement and metabolism.

Bussenius has recently reported a case

(*Zeitschrift Klin. Med.*, Nos. 1–4,) of pernicious anemia in which he attributes the destruction of the red blood corpuscles to toxins contained in decomposed thyroid tablets, which the patient had taken to reduce his weight. It seems no more than probable that absorption of various toxic substances from the alimentary canal may play an exceedingly important rôle in the production of this disease.

THE EVIL EFFECTS OF TOBACCO.

THAT tobacco is a poison no one attempts to deny, its poisonous effects being universally manifested in the beginner's attempt to bring his system into a state of tolerance to it. The deathly sickness produced by the initial dose of tobacco is all the evidence that is necessary to demonstrate conclusively that it is a virulent poison, and that the human organism is not at all in sympathy with cultivating its acquaintance. In the majority of instances it requires a great deal of courage and stick-to-it-iveness on the part of the beginner to accustom himself to its poisonous influence, and, were it not for the fact that others have succeeded, many would undoubtedly give up in despair.

Tolerance is soon established, however, and the felicity obtained by its use soon causes the individual to forget his early experiences. Sooner or later evidences of faulty nutrition, which may be manifested in a variety of ways, make their appearance, and, if a careful study into the etiology of these conditions is made, a very large percentage of the cases will be found to have their origin in the use of tobacco, alcohol, tea, coffee, and other anti-nutritive substances.

Dr. I. N. Love, in an address on Nutrition and Stimulation (read before the Mississippi Valley Medical Association, at Asheville, N. C., October, 1900, and appearing in the March 2d number of *The Journal of the American Medical Association*), summarizes his views with reference to the use of tobacco as follows:—

"1. Smoking is more harmful than chewing, for the reason that the nervous system is not only more injuriously affected, but the catarrhal disturbances of the air-passages render the smoker more liable to dangerous and fatal diseases of the air-passages.

"2. The excessive smoker is not only more liable to pneumonia, la grippe, tuberculosis, laryngeal and pulmonary, as the sensitive mucous surface and the bankrupted nervous system present a double invitation at all times, but fatal results are more apt to occur. Every case of laryngeal tuberculosis coming under my observation for several years has presented a history of the victim's being a smoker, in the majority of instances to excess.

"3. Heart failure is a frequent complication, and is serious with excessive smokers.

"4. Cigarette smoking is worse than either the cigar or the pipe, but only for the reason that, the cigarettes being milder tobacco, the smoker universally inhales the tobacco fumes; and when we realize what are the component parts of tobacco smoke and how direct are the routes from the vesicles of the lungs into the blood current, we can appreciate the ill effect.

"5. Inveighing against the cigarette on the ground that the paper is poisonous and the tobacco drugged, mixed with opium, Indian hemp, etc., is all wrong, as the cigarette, being a milder tobacco, perfectly pure, and the paper unobjectionable, if smoked without inhaling and in a temperate way, is to be preferred.

"6. The cigarette smoker nearly always inhales the smoke, and becoming habituated to this quick toxic action, he will not smoke without inhaling, whether he uses the cigarette, the cigar, or the pipe, for the same reason that the morphine habitué, accustomed to the hypodermic

method, will not be satisfied with the drug through the mouth, both victims want quick action.

"7. Children who use tobacco before reaching maturity have their growth interrupted, as nothing more definitely interferes with the equilibrium of tissue-building, digestion, assimilation, elimination, and metabolism, than tobacco, and for these reasons its use favors gouty diseases, atheromatous degeneration, premature senility and decay. The excessive users of tobacco are crippled in their general equipment, and are in no form to wrestle successfully with any disease.

"8. He who smokes cigarettes to excess, or uses tobacco in any form to excess, is in danger of becoming an alcoholic, but in even greater danger of becoming a drugger, as tobacco is so closely allied to opium and Indian hemp. In a general way, one excess invites another, as the will power becomes lessened.

"9. Nothing is so apt to bankrupt the sexual equipment as tobacco, unless it be opium, as it stands to reason that a cerebrospinal paralyzant must obtund sexual desire and power.

"10. The numerous mental wrecks, youths who have come under my care during the past ten years, whose lives were failures, or who fill suicides' graves, impress me that to-day tobacco stands as the gravest danger confronting the new century, and the medical profession has a fearful responsibility in educating young men and their parents to appreciate this danger.

"The business world is, I am glad to see, undertaking the solution of the tobacco problem the same as it has that of alcohol, in that it is declining to employ cigarette fiends as well as moderate or excessive drinkers.

"I am firm in the view that the medical profession must study calmly, tolerantly, temperately, the problems related to stimulants of all kinds, but tobacco and alcohol in particular, and they put themselves in best form for doing the best work along these lines and wielding their greatest influence for good, by themselves being exemplars of temperance, self restraint, self-denial, and correct living." C. E. S.

REVIEWS.

A TEXT-BOOK ON PRACTICAL OBSTETRICS. — By Egbert H. Grandin, M. D., gynecologist to the Columbus Hospital; with the collaboration of George W. Jarman, M. D., gynecologist to the Cancer Hospital. Third edition, revised and enlarged. Illustrated; more than 500 pages. Extra cloth, $4.00, net; sheep, $4.75, net. The F. A. Davis Company, Publishers, Philadelphia.

The last few years have demonstrated the superiority of practical over theoretical instruction in medicine, and we are glad to welcome such a volume as this, one which gives in a concise and systematic manner the essentials pertaining to the practical side of obstetrics.

The book is good in every particular, and we heartily recommend it to students and practitioners who are interested in obstetrics.

A SYSTEM OF PHYSIOLOGIC THERAPEUTICS. — Edited by Solomon Solis Cohen, A. M., M. D. This is a series of volumes which will cover the whole subject of physiological therapeutics as distinguished from drug medication, and will comprise treatises on electro-therapeutics, climatology, nursing, diet-therapy, mechanotherapy, rest, hydrotherapy, pneumotherapy, serumtherapy, etc. The first two volumes, devoted to electrotherapy, are prepared by Prof. George W. Jacobey. The long list of able authors mentioned in connection with this series of volumes is itself a guarantee that the subjects considered will be treated in both a scientific and a practical manner. The publishers have certainly chosen an opportune moment for the presentation of this work. The attention of the medical profession everywhere is being turned toward the more extended employment of physiological remedies as the most rational and scientific method of dealing with disease in either acute or chronic forms. Dr. Cohen has been an able advocate of physiological therapeutics for many years, and is as well prepared as any man in this country, perhaps, to undertake the editorship of a work of this sort. The work is published on fine paper, is well illustrated, and will receive a warm welcome from the progressive members of the profession. It ought to have a large sale.

The Battle Creek Sanitarium
LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
NEWTON EVANS, M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR APRIL.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total
104 per cent	8	2	10
100 " "	108	51	159
96 " "	19	30	49
93 " "	28	28	56
89 " "	9	6	15
86 " "	3	7	10
82 " "	4	2	6
79 " "	8	1	9
75 " "	0	2	2
71 " "	2	2	4
64 " "	0	1	1
50 " "	0	1	1
Total	189	133	322

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	93	39	132
Between 4,500,000 and 5,000,000	44	45	89
" 4,000,000 " 4,500,000	39	34	73
" 3,500,000 " 4,000,000	9	8	17
" 3,000,000 " 3,500,000	2	3	5
" 2,500,000 " 3,000,000	1	1	2
Below 2,500,000	1	3	4
Total	189	133	322

Examination of Sputum.—There were 59 examinations made, 50 being new cases. Tubercle bacilli were found in 8 cases.

States from which tubercular patients came: Indiana, 2; Illinois, 2; Tennessee, 2; Wisconsin, 1; Minnesota, 1.

Gastric Laboratory.—

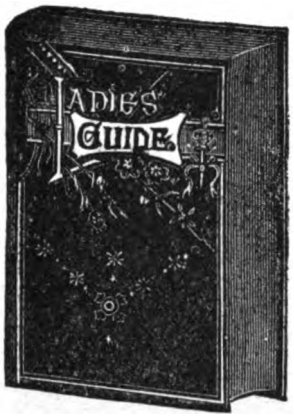
	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cen	Cases	Per Cent	Cases	Per Cent
Without bacteria	74	98	26	93	88	81	188	89
Less than 10,000 bac.	1	2	2	7	7	7	10	5
Between 10,000 and 100,000 bac.					7	7	7	3
More than 100,000 bac.					6	5	6	3
Total	75	100	28	100	108	100	211	100

The patients were received from the following States and countries: Michigan, 46; Ohio, 19; Illinois, 16; Minnesota, 15; Indiana, 13; Iowa, 12; Pennsylvania, 10; Kansas, 9; Wisconsin, 9; Canada, 7; Colorado, 6; Nebraska, 5; Tennessee, 5; Texas, 4; Louisiana, 4; Missouri, 4; West Virginia, 3; Kentucky, 3; Indiana, 2; New York, 2; Maine, 2; Massachusetts, 2; District of Columbia, 2; Georgia, 1; Utah, 1; California, 1; North Carolina, 1; New Mexico, 1; England, 1; Montana, 1; Norway, 1; Pacific Islands, 1.

Urinary Laboratory.—Total number of specimens examined, 869; number of new cases, 311; number of cases having albumin, 20; sugar, 10; casts, 7; blood, 2; pus, 41.

PUBLISHERS' DEPARTMENT.

THE ST. PAUL MEETING AND YELLOWSTONE PARK.—Arrangements have been completed for an excursion of the members of the American Medical Association to Yellowstone Park. The Committee of Arrangements has finally succeeded in persuading the officials to open up the park a week earlier than usual, in order to accommodate the Association. A special train will be run from St. Paul to the Yellowstone Park, and the railroad officials have promised to do everything in their power to make it satisfactory to all concerned. The rates will be very low, but how low can not at this time be definitely stated. Those who attended the meeting in 1882 will remember with much pleasure a similar excursion that was run at that time, and these will not need to be informed that the one now proposed will be full of enjoyment. Further announcements will be made later. The Yellowstone National Park contains more natural wonders than are to be found anywhere else in the world, and this will be a rare opportunity for our Eastern friends to see what this portion of our Great West possesses.



....THE....

Ladies' Guide

In Health and Disease

BY J. H. KELLOGG, M. D.

THIS work admirably meets a want that has long been recognised by intelligent women in all parts of the land. Having devoted many years to the study of the diseases to which the sex is peculiarly liable, as physician-in-chief of one of the largest health, medical, and surgical institutions in the United States, and in the treatment of thousands of women suffering from all forms of local disease, the author has brought to his work in the preparation of this volume a thorough education and a rich experience, which have enabled him to produce a volume eminently practical in character, and calculated to fill the place in the practical education of women for which it is intended. It tells mothers *just what they ought to know*, in language they can not fail to understand; and daughters who value their health, and the happiness which follows health, can not afford NOT to know what this book teaches them.

This book is divided into seven parts, or sections. It graphically describes the great mystery of life,—the anatomy and physiology of reproduction. Four of the sections bear respectively the following headings: "*The Little Girl*," "*The Young Lady*," "*The Wife*," and "*The Mother*." A most thorough discussion is given concerning the special dangers incident to puberty in girls, the physical and mental training of young ladies, the evils of improper dress and how to dress healthfully, the education of young ladies, personal beauty, courtship and marriage; the duties, rights, and privileges of the wife, the dangers of health incident to the matrimonial state, the prevention of conception, how to predict and regulate the sex of offspring, criminal abortion, and the *special means* which wives may adopt for the preservation of their health. Due consideration is given to the perils of motherhood and how they may be avoided, including instructions by following which child-bearing may be made painless in most cases, and greatly mitigated in all. The management of pregnancy is also fully treated, and a large amount of new and invaluable instruction given on this important subject, which makes the "Guide" a very valuable book for midwives, nurses, and physicians. One section of the book is devoted to the diseases of women, together with their proper treatment, the latter subject being treated differently than in any other work extant, and embodying the various methods in use by the author, and by the best specialists in this and foreign countries, which bring about such remarkable results when intelligently employed. The directions given are so simple, and the means to be employed in treatment so readily accessible, that the treatment can be carried on successfully in most cases at the home of the patient without the assistance of a physician, thus saving many a doctor's bill. The concluding section of the work is an Appendix, where is found rational home treatment for diseases of childhood, such as croup, diphtheria, whooping cough, convulsions, measles, scarlet fever, etc., etc.; also full instructions for baths of various kinds, Swedish movements, postural treatment, electricity, massage, diet for invalids, many invaluable recipes, medicinal recipes, and *prescriptions* for the various diseases treated in the work. A Glossary and Alphabetical Index follow the Appendix.

Girlhood
Maidenhood
Wifehood
Motherhood

The work contains ***672 octavo pages,*** and is ***illustrated by means of thirty-five chromo-lithographic plates, cuts, and colored plates.*** For the purpose of removing a possible objection which might be raised, a few of the plates are printed on a sheet by themselves, are carefully concealed in a little pocket in the cover of the book, and may be removed at pleasure.

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MODERN MEDICINE

VOL. X. BATTLE CREEK, MICH., U. S. A., JUNE, 1901. NO. 6.

ORIGINAL ARTICLES.

NEURASTHENIA.

BY J. H. KELLOGG, M. D.,
Superintendent of the Battle Creek Sanitarium.

SOME authors consider neurasthenia as a distinct pathological entity, because of the fact demonstrated by Hodge that long-continued activity results in a physical change in the nerve cell. It appears to the writer that this disease may be more justly regarded as like dropsy, insomnia, and a variety of other individual functional disturbances, or groups of disturbances, as a pathological picture which represents not a primary disease, but the result of a number of pathological processes, which may exist singly or in combination, as the real foundation of this so-called malady.

The nervous system is made up of the most highly vitalized elements of the body, and manifests remarkable ability to maintain its integrity so long as other bodily functions are properly performed. Nerve centers may be exhausted by overwork, it is true, but rest is a panacea for the consequences of physiological activity. In neurasthenia, rest alone does not cure, for the reason that the natural processes by which repair and restoration are effected are in some way interfered with. The morbid process which interferes with restorative metabolism and thus induces a state of chronic fatigue, is the real pathological entity. For convenience, however, neurasthenia may be discussed as a morbid condition dependent upon various other morbid states. It is by no means the only so-called disease which, regarded from a strictly physiological standpoint, should be classified merely as a group of symptoms rather than as a distinct pathological entity. Considered from this standpoint, neurasthenia, or the group of symptoms to which the term is commonly applied, will be found present in many cases in which extreme exhaustion has not played an active part as a causative feature. In fact, from the writer's observation, this is most generally the case. Patients, if they are suffering from exhaustion as the result of overwork, are usually, in the writer's opinion, suffering not from overwork, but from the general toxemia which is the natural consequence of a sedentary life. Too little rather than too much work is the actual cause in the majority of these cases. With the proper amount of muscular exercise daily, together with proper diet and attention to the other measures of hygiene, so-called "nervous breakdown" resulting in what is termed neurasthenia, would be extremely rare.

Bouchard, Huchard, and Vigoroux have called attention to the relation of the uric acid diathesis to neurasthenia, the condition being one of autointoxication resulting from insufficient oxidation of the nitrogenous wastes. The writer has been for many years interested in the study of neurasthenia, having acted as office and dispensary assistant to the late Dr. Geo. M. Baird while he was engaged in collecting the data for his famous work on neurasthenia. Careful analysis of the work of Baird, and observations made in the treatment of many thousands of nervous persons in the last twenty-five years, and a study of the leading English, French, and German works upon this subject, have led the writer to the conclusion above stated.

In the treatment of neurasthenia it is convenient to divide cases into the following classes, according to the underlying cause to which the multitudinous symptoms of the disease may be due:—

1. Neurasthenia Due to Toxemia.—This condition results from toxins introduced into the body or generated in the tissues of the alimentary canal. Fatigue poisons, the result of muscular work, inhibit muscular activity. Nerve toxins resulting

from activity of nerves and nerve centers, likewise produce inhibition of nerve activity, as shown in intellectual fatigue. By deficient oxidation or inefficient activity of the skin, kidneys, liver, and other poison-eliminating or poison-destroying structures, the tissue wastes are allowed to accumulate, and as the result, all forms of vital activity in the body are diminished, among others, the functions of the nerve centers, the symptoms of which are naturally more prominent than those arising from other disturbances or other functions, for the reason that the nerves are the chief means by which morbid conditions of the body may be expressed. Decomposition of food stuffs taking place in the stomach and intestines as the result of dilatation of the stomach and colon, prolapse of these organs, or other morbid conditions, give rise to the production of great quantities of ptomains and toxins, which, when absorbed into the blood, produce conditions allied to those resulting from retained tissue wastes. Toxic substances identical with both these classes of poisons may be introduced into the alimentary canal in the food, particularly in old cheese and in meats in which decomposition has begun, as in hung game meats, beef with *haut goût*. Haig has clearly pointed out the evils which arise from this cause, and the profession is coming to recognize a series of maladies which may be properly termed meat-eaters' disorders, from their being so largely dependent upon the free use of flesh food.

2. Neurasthenia Due to Exhaustion.—(*a*) Exhaustion from prolonged muscular or mental work, especially when associated with loss of sleep or with worry, as seen in the weary mother, the anxious speculator or judge, the overworked doctors, nurses, and students, and in other classes of sedentary workers.

(*b*) Sexual exhaustion from the various forms of sexual excesses, profuse vaginal leucorrhea, intrauterine hemorrhages due to fibroids, profuse or frequent menorrhagia or too frequent menstruation, metrorrhagia from any cause, or spermatorrhea.

(*c*) Starvation, the prolonged use of a diet lacking in essential elements, particularly a diet containing a deficiency of proteid or fat, as one consisting chiefly of potatoes, superfine white bread, tea, and toast,—the so-called "vegetarian" neurasthenia.

3. Neurasthenia Due to Reflex Irritation.—This form of the disease has its foundation in a disturbance of the sympathetic centers, set up by visceral irritation, and reflected upon the central nervous system. Every nerve cell in the body, as well as every other structure, is under the control of the sympathetic. The seat of a visceral irritation may be the stomach; the sexual glands in men or women; the prostate and urethra in men; the urethra or uterus in women; the rectum when the seat of fissures, ulcers, hemorrhoids, or chronic irritation in both sexes; rectal and vaginal leucorrhea; and prolapse of the stomach, bowels, liver, kidneys, or spleen, in either men or women; uterine and ovarian displacements in women. The continued excitation of the ganglia of the central nervous system as the result of irritation originating in any of the viscera named or in other parts capable of exciting reflex sympathetic irritation, results in a constant waste of nerve energy, so that the nerve centers are never able to acquire a store of energy, and hence manifest the symptoms characteristic of the condition long ago described by that eminent clinical teacher, Trousseau, as "irritable weakness."

4. Neurasthenia of Traumatic Origin.—The influence of shock in impairing the integrity of the nerve centers and inhibiting the output of energy or preventing the proper anabolic activity by which energy may be stored for use, has been clearly demonstrated. This form of neurasthenia is perhaps the least common of all, but, nevertheless, represents a distinct class.

5. Mixed Cases.—Various combinations of the several forms of neurasthenia above mentioned may be encountered. The most common are, (*a*) gastric neurasthenia and exhaustion of the nerve centers due to reflex irritation combined with a toxic state resulting from the retention of waste products or the absorption of ptomains and other toxins in the alimentary canal; (*b*) an association of gastric and sexual neurasthenia, a very common combination, to which may be added also tonic toxemia.

The symptoms of the various forms of neurasthenia we shall not enumerate here for lack of space. Nearly all chronic disorders may be simulated by this disease, except those due to organic changes in the central nervous system. Hyperesthesias and paresthesias are very common,

but paralyses do not belong to this affection. A physical symptom which is very prominent, especially in cases in which the disease is due to reflex irritation, is hyperesthesia of the ganglia of the abdominal sympathetic, shown by extreme sensitiveness of the solar plexus and lumbar ganglia when pressed upon by the finger, also great tenderness of the subumbilical ganglia, or so-called aortic plexus.

Treatment.— The several classes of neurasthenics require the application of special measures of treatment. A great variety of measures may be introduced with advantage in dealing with the great variety of conditions which are encountered, but hydrotherapy alone, when rightly adjusted to individual cases and conditions, is capable of meeting nearly every indication which can arise. Hydrotherapy endeavors to strike at the root of the difficulty in each class of cases, and even when employed with the direct object of relieving curatively, sometimes much more than temporary or palliative benefit is obtained, for the reason that even when used as a palliative, the effect sought is generally gained through the removal of causes rather than by the simple obscuration of the real condition present, by the temporary removal of the symptoms.

There are two general indications in all classes of neurasthenia:—

1. Employment of systematic measures or methods of treatment directed toward a removal of the cause of the disease. These applications must be made regularly, systematically, and carefully graduated to each individual's needs and idiosyncrasies, and continued in most cases for a long time, as four to six months in ordinary chronic cases, and in extremely chronic cases, extended for a year or even more. The aim must be not only to make the patient comfortable by removal of his distressing symptoms, but to build him up to such a state of health that he will for the future be able to resist those morbid influences which have broken him down.

2. Symptomatic or palliative treatment addressed to the prompt relief of prominent symptoms, such as nervousness, pain, sleeplessness, etc.

Treatment of Neurasthenia Due to Chronic Toxemia.— The most important measures are, a sweating process, which will be employed from two to four times weekly, and may consist of an electric-light bath, a vapor, hot air, Turkish, or immersion bath, a hot blanket pack, sweating wet sheet pack, or even the dry pack. The sweating process should always be followed by a cold application. The cold douche, especially the percussion douche, to the spine is the most efficient form of cold application; but cold friction, the cold-towel rub, the shallow bath, and wet-sheet rubbing are the measures which may be advantageously employed. The patient must be gradually trained to the employment of more and more vigorous measures.

The diet must be generous but aseptic, and free from the toxic substances or substances which may easily produce ptomains and toxins by decomposition in the alimentary canal. Flesh foods must be altogether interdicted. In case of dilatation of the stomach and colon, milk must be avoided, as shown by Glenard. A fruit diet is especially useful in this disease. When dilatation of the stomach exists, decomposing food must be regularly removed by means of the stomach tube. Gastric lavage should be administered for this purpose at least two or three times a week, until the condition is relieved. If constipation exists, a colo-clyster followed by a small cold enema should be employed for a time. Constipation must be permanently relieved by the use of the graduated enema or other means. When obesity is present, or if the patient is quite vigorous, or in cases in which the skin is sallow and inactive, the sweating process may be employed from three to six times weekly. Copious water drinking should be encouraged, and the patient should lead an out-of-door life.

Treatment of Neurasthenia Due to Exhaustion.— When the condition is the result of violent muscular effort, rest in bed is required. Mental exhaustion demands moderate exercise out of doors, unless so great exhaustion exists that even this amount of exercise produces fatigue, in which case the rest-cure should be employed for two or three weeks, and exercise should be begun by means of manual Swedish movements, massage, and bed exercises. Patients who are thin in flesh, usually require rest in bed and a fattening diet. Prolonged hot baths must be avoided. Very short hot baths may be employed as a preparation for cold pro-

cedures. The duration should be one to three minutes, just sufficient to heat the skin well, and should be followed by a very short cold douche, the rubbing wet-sheet or cold friction, according to the degree of training which the patient has reached. A percussion douche to the spine is perhaps the most powerful of all means of arousing the weakened centers to activity and improving their nutrition by producing strong fluxion of blood through the starved centers. More good may be effected in these cases by improving the movement, of blood through the exhausted nerve centers than by any other means.

Prolonged cold treatments must be avoided, as the nerve centers, being weakened, are not able to respond. Hot and cold sponging, the alternate douche, and the Scotch douche to the spine, are useful measures, as also the alternate compress and the very hot douche, followed by the tepid or cold fan douche or affusion in cases in which hyperesthesia of the spine exists. Anemic patients require intense but very short applications. The diet, when anemia is a prominent symptom, should consist of highly nitrogenous foods, as nuts and nut products, kumyss, kumyzoon, matzoon, buttermilk, malted nuts, zwieback, malted cereals.

Treatment of Neurasthenia Due to Reflex Irritation.— General tonic measures recommended for the preceding classes are applicable to this class, but special care must be taken to avoid cold applications to the parts which are the seat of irritation. These parts may be protected by the application of a very hot fan douche or fomentation before the cold application. The patient may be trained to endure cold applications by graduated treatment, and by the use of the Scotch douche consisting of a warm rain douche, 100°–102°, for one or two minutes, followed by a broken jet with little pressure, applied especially to the spine and legs. Special local applications are required for the relief of various foci of reflex irritation.

(*a*) Sexual irritation, giving rise to so-called sexual neurasthenia, requires the hot sitz bath, 110°–115°, five or ten minutes, followed by the cold broken jet to the hips for ten or fifteen seconds. When local pain is not a prominent feature, the cold rubbing sitz, 70°–75°, for four minutes, may be advantageously administered twice a day. The vaginal douche, 104°, should be given for ovarian and uterine irritation in connection with a sitz bath. The douche should precede the sitz bath. In men the psycophore may be advantageously employed to relieve prostatic and urethral irritation. The cold or hot Scotch perineal douche is useful in the cases last mentioned. Urethral stricture, when existing in men, should be relieved if necessary by surgical procedures. Uterine displacements, lacerations of the cervix, so-called endometritis, ovarian prolapse, should also receive proper attention, surgical if necessary.

(*b*) Gastric irritation giving rise to so-called gastric neurasthenia, fomentations over the stomach at night followed by the heating compress to be worn during the night, the hot and cold trunk pack, the hot fan douche over the stomach and spine opposite, in hyperpepsia, the cold fan douche over the stomach and spine; in hypopepsia, fomentations for fifteen or twenty minutes, or a hot bag over the stomach an hour after eating when the digestive process is painful and gives rise to reflex irritation; a lavage once or twice a week when necessary; fomentations at any time when gastric irritation exists; an abdominal supporter for relief of gastroptosis, or prolapse of the stomach; special massage with replacement of the stomach in the last-named cases, also in cases of gastric dilatation.

(*c*) Cases of intestinal catarrh or so-called catarrh of the bowels, is almost invariably accompanied by neurasthenic symptoms. The special procedures required are, fomentations over the abdomen at night followed by the moist abdominal bandage to be worn during the night, the heating compress to be worn during the day and changed every four hours. The compress should be wrung dry out of water at 60°, and should be protected by an impervious covering. The bowels must be thoroughly evacuated by the coloclyster. Tepid water should be introduced, and the addition of tannic acid is useful as a germicide. The sitz bath for five minutes, 115°–120°, followed by the rubbing sitz for two minutes, 70°–75°, may be usefully employed in these cases, until the patient has become accustomed to the contact of cold water.

(*d*) Rectal irritation arising from hemorrhoids, fissure, irritable rectum, rectal leucorrhea, are conditions which

sometimes require surgical procedures. Mitigation of symptoms may always be obtained by the use of proper hydriatic procedures. The rectum should be cleansed by the injection of a little tepid water after each stool. In the case of hemorrhoids, cold water may be employed. Painful fissure, and irritable rectum are generally relieved by the very hot sitz, or by hot irrigation. When inflammatory conditions are present, cold irrigation is preferable. Cold applications over the anus and perineum, and the revulsive compress are excellent means for affording relief from pain.

(*e*) Enteroptosis requires especially the abdominal supporter, cold applications to the abdomen, the cold or Scotch douche to the abdomen with little pressure, the wet girdle at night without the impervious covering, and other similar measures.

Mixed cases require a combination of the measures above suggested. For example, in cases in which sexual and gastric irritability exist in combination, — a class of cases which is very common, — the sitz bath, cold or hot as may be indicated, and the moist abdominal bandage are measures especially useful. The cold douche to the region of the hips and stomach must be avoided, also the cold douche to the feet. The broken douche at a temperature of 75°-85°, may be used after a hot sitz, the warm rain douche, a large fomentation, or some other heating procedure. By degrees the patient may be carefully trained to accept water at a lower temperature and applied with greater pressure.

Symptomatic Treatment of Neurasthenia. — The various symptoms of this condition must receive attention to remove local irritation, and thus save continued waste of nervous energy, and to encourage the patient by demonstrating to him the efficiency of the methods employed.

It is true that the symptoms will disappear of themselves when the causes upon which they are dependent have been removed. But as has already been remarked, hydriatic treatment, when used for palliation, not only removes the symptom, but renders more or less permanent benefit by favorably influencing the morbid conditions which give rise to this symptom. The palliation of symptoms by means of medicinal tonics, narcotics, and drugs of various sorts, accomplishes little or no good in these cases, for the symptoms are certain to return, and generally with increased vigor. The remedies employed must be such as will reach the root of the malady by balancing the circulation, by arousing the dormant energies of the weakened nerve centers, and by setting in operation natural recuperative processes. Not undertaking to include in the following category all the symptoms which will be encountered in neurasthenia, we will mention: —

Headache. — If the tissues are sensitive, apply a light, very hot compress for four to eight minutes, followed by very short cold applications. For frontal headache, apply a revulsive compress over the forehead and eyes. Fomentations to the abdomen or the hot and cold trunk pack are likewise useful in relieving headache.

Congestive Headache. — Apply a cold compress continuously to the top of the head and the face, with very hot applications for one or two minutes to the back of the neck; or the ice bag may be applied to the back of the neck, or the ice compress or the ice collar may be employed in connection with cold applications to the vertex.

Occipital Headache. — Apply to the spine from the base of the brain downward to the middle dorsal region, very hot sponging, alternate sponging, or the revulsive compress. In some cases it is advantageous to apply a cold cheese-cloth compress to the face at the same time.

Nervous Headache. — Apply fomentations over the seat of pain for fifteen or twenty minutes. If there is much congestion with throbbing of the head, or if this results from the application, follow the fomentation with a cold cheese-cloth compress for one or two minutes or longer, if relief is experienced. Alternate hot and cold compresses are sometimes most efficient. Gastric lavage is generally required. If given before the attack is fairly begun, relief may generally be obtained, and the attack may be shortened in many cases by the later use of the stomach tube through removal from the stomach of the products of decomposition. A hot enema or coloclyster is generally required.

General Languor and Weakness. — A sovereign remedy is cold applications to the cutaneous surface, and especially the

full jet or percussion douche to the spine. These applications must be graduated to suit the individual case, and a heating process of some sort should be applied before the cold application.

The Sensation of a Band about the Head.— This very unpleasant sensation is generally removed by sponging with very hot water. Pressure at the vertex requires a cold compress.

Backache.— This is relieved by fomentations to the abdomen or epigastrium, followed by the heating compress. In some cases the fomentation must also be applied to the spine. The revulsive compress and the alternate compress to the spine afford greater relief in some cases than heat alone. The abdominal supporter relieves a larger proportion of cases than any other means.

Neuralgia.— This symptom is exceedingly common in most forms of neurasthenia. It may be briefly mentioned that the most efficient means of palliation are the revulsive compress and the Scotch revulsive douche.

Insomnia.— The neutral bath for half an hour to an hour and a half just before retiring, and the heating abdominal compress, or Neptune's girdle, are the best measures for this condition.

Vertigo.— This is generally due to gastric irritation. Fomentations to the stomach, moist abdominal bandage, and gastric lavage are the most essential measures. Bathing the face with very hot water or very cold water, and the application of hot or cold water to the top of the head, afford temporary relief.

Muscular Weakness.— The percussion douche to the spine, and the alternate or percussion douche over the feeble muscles, result in an enormous increase in muscular energy and capacity.

Mental Depression — The general cold douche, especially the percussion douche, to the spine, following a sweating process, has a wonderful effect in overcoming mental depression. The neutral bath for half an hour to an hour daily, and the neutral pack, are highly useful measures for removing this symptom.

Fidgets.— This symptom is due to irritation of the sympathetic ganglia. It is generally relieved by a fomentation to the abdomen at night, a heating compress worn during the night. and the abdominal supporter to be worn during the day.

Dreams.— Employ the neutral bath for half an hour at bedtime, 92°–95°; a heating compress during the night; an evaporating head cap when the head is congested; elevate the head of the bed; employ any means for the relief of cerebral congestion.

Flushing.— This symptom is a vasomotor disturbance indicating irritability of the sympathetic centers. Apply the Scotch douche or the hot fan douche to the abdomen, especially the umbilical region. Employ the moist abdominal bandage at night. The symptom will disappear with improved nerve tone under cold applications.

Cold Extremities.— Apply the Scotch douche, the heating compress to each leg separately, to be worn during the night; the shallow foot bath, to produce sweating. The sweating bath followed by the cold douche, sponging with hot water at bedtime in cases in which the perspiration occurs chiefly during sleep.

THE INSOMNIA OF AUTOINTOXICATION.

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INSOMNIA is undoubtedly one of the most distressing of the various symptoms of nervous disorders. An individual may suffer severe pain for months, and yet maintain a moderate degree of health; but how quickly disintegration of the entire nervous system begins to take place when the patient is totally deprived of sleep for even a few days!

Fortunately, insomnia is more frequently an indication of some functional disorder than of an organic lesion. Sleeplessness in its early stages is generally a protest of the nervous system against some definite violation of physical law; but later the nervous system may almost, as it were, acquire the sleepless habit, and this abnormal condition may become practically a normal condition with that particular patient, and occasionally even a remarkable degree of immunity against the effects of loss of sleep seems to be acquired, so that an incredibly slight amount of nature's sweet restorer seems reasonably to satisfy the demands of the organism.

The most common form of persistent

insomnia is due to a condition of toxemia of the system, and in some cases indicates a defective power to eliminate the toxic substances naturally formed in the process of nutrition; but in more instances it results from the erroneous habits of the patient himself. When a nervous person, whose digestion is already more or less disordered, attempts to subsist largely upon flesh foods, continually draining through his system large quantities of tea and coffee, and using tobacco immoderately, or even in what is ordinarily regarded as moderation, he need not be surprised if he must spend wakeful hours meditating upon the truthfulness of that principle which is so clearly enunciated both in revelation and in nature, that "the way of the transgressor is hard"

It is irrational to attempt to produce sleep by the use of various sedative drugs; for while they do temporarily so anæsthetize the brain cells that they are not conscious of the toxic substances that were previously irritating them, yet it must be evident that these drugs do not merely take a short excursion to the brain, but that they are diffused throughout the entire circulation, and must to a greater or less extent benumb the eliminating organs, thus tending virtually to increase the cause of the patient's difficulty. This has been clearly proved by injecting into the veins of a rabbit, according to the method elaborated by Bouchard, the urine of a patient obtained both before and after he took the sedative drug. It was found that the urine was far more toxic before the introduction of the drug than for a day or so afterward. This suggests that the introduction of the sleep-producing drug simply tended to accumulate in the system the poisons that were already so successively keeping the patient awake, thus naturally requiring a larger dose the succeeding night to secure any satisfactory effect.

The rational and successful plan to adopt in these cases is evidently to cut off absolutely all the various food substances which either tend to introduce waste and irritating products into the circulation, or which are likely to ferment or decompose in the already weakened alimentary canal; and then adopt such a line of treatment as will increase the patient's power of elimination, and at the same time tone up by *physiological* rather than by artificial stimulation the exhausted nerve cells. It is the purpose of this paper to point out in a general way the procedures to be adopted, and which have been successfully employed in thousands of such cases.

Dietary.— Such patients frequently have heavily coated tongues, indicating not only their weakened vitality, but also disordered digestion. Nothing will prove more efficient to improve this condition than placing the patient upon an absolute fruit diet for several days. Laboratory experiments have demonstrated that the growth of the germs which naturally inhabit the stomach is largely inhibited by the presence of fruit and fruit juices. Raw fruit, baked apples, and any stewed fruit which is not sufficiently acid to require sugar, may be used; the patient may be allowed to eat freely of the same four times a day. In ordinary cases, the tongue will begin to clear up around the edges in a day or two, and soon the entire coating will have disappeared, and the patient will feel much better. The adoption of this exclusive fruit dietary for a few days is all that is necessary, in many cases, to enable the patient to secure more than his usual amount of sleep. Flesh foods, tea and coffee, spices, and condiments must all be interdicted, as they tend to introduce into the circulation substances with which the already oversensitive nerve centers should not be taxed.

After using the exclusive fruit dietary for a few days, toasted breads in the form of zwieback and granose cakes, and such toasted cereals as browned rice, crystal wheat, or granola, may be added to advantage. The object of having these grain preparations so thoroughly dextrinized is that the saliva may transform them at once into maltose, and they may be absorbed before there is time for them to ferment, thus further irritating the nervous system. The patient can gradually begin to use other pure-food products with perfect safety.

General Treatment.— The treatment should be tonic in its nature early in the day, but decidedly sedative just prior to retiring. The graduated alternating hot and cold douches to the spine, beginning with moderate temperatures, may be employed with decided advantage. These may be followed by gentle massage, which will to a certain extent substitute the ex-

ercise which the patient so sadly needs, but which he is ordinarily too weak to take.

Bouchard and Roger have both called attention to the fact that the urine produced during sleep following a day of moderate exercise is decidedly less toxic than the urine produced in the same individual after a day spent in some sedentary employment. This emphasizes the necessity of either exercise or massage for the class of patients in whom the insomnia is due to autointoxication. Cold mitten friction, beginning at a temperature of 30° and decreasing several degrees a day, may be employed with profit; and as the patient progresses, other more tonic hydriatic measures may be employed, such as cold towel rubs, percussion douches, cold sponge baths, etc. These serve to arouse in a normal manner every cell in the body to do its utmost.

One of the most beneficial treatments to be administered in the evening is the neutral bath, given at a temperature of about 94° to 96°, or very nearly the temperature of the skin, and it may be continued for half an hour to an hour, or even longer. The wonderful sedative power that is wrapped up in this simple procedure is truly remarkable. Patients frequently drop off to sleep in this bath, and those who have been previously unable to sleep will ordinarily secure several hours of refreshing slumber immediately following the bath. The bath should not be cooled down before leaving, nor should any special attempt be made to rub the patient, as these measures all tend to excite the nervous system, and thus defeat the real object of the treatment. Frequently the efficiency of this bath seems to be very much increased by allowing a mild galvanic current to pass through the water. It would be difficult to conceive of a more obstinate form of insomnia than is manifested in the cure of the typical morphine fiend, yet these patients soon discover the sedative properties of this bath sufficiently to ask for it in preference to a small dose of their favorite drug.

Another procedure which is very convenient, though not quite so efficient, is a moderately warm footbath, with fomentations to the spine, applying a cold compress to the head at the same time. This measure is particularly serviceable in those cases in which the insomnia is largely due rather to cerebral congestion than to any reflex irritation. These patients are also very much benefited by wearing at night an abdominal girdle which will retain the heat and moisture, and thus act as a gentle fomentation during the entire night. This procedure will tend to dilate the abdominal and visceral blood-vessels, and thus to a certain extent relieve the congestion of the brain. Dr. Brunton, in commenting on this principle, has called attention to the fact that animals invariably curl up when they go to sleep, so as to keep their abdomens warm. It certainly is true that the portal circulation, when sufficiently dilated, can contain practically all the blood of the body. Such a girdle must have a layer of cotton put next to the cold moist muslin, and then a layer of some impervious material, such as mackintosh, oilcloth, or even ordinary newspaper, and then a layer of flannel pinned snugly on the outside to secure the whole. Extreme care should be taken that the moist muslin is a little narrower than the covering, otherwise, on account of the evaporation of moisture from the exposed wet edges, the object to be attained will be defeated by the chilling of the nerves.

Another valuable adjunct in securing good sleep is a cool room. Many patients suffering from insomnia habituate themselves to hot, stuffy rooms, and imagine that they will catch cold or have some other serious illness if the temperature of the room is allowed to fall to 50° or 60°. But this temperature is far more conducive to sleep than a higher one.

Another essential thing is to have the patient spend a large share of his time outdoors, not tramping around constantly, thus using up the little available nerve energy he has, but perhaps laying wrapped up on a cot in the open air. Very often the patient who has spent the previous night in a sleepless and most wretched manner, by merely wrapping himself up and lying down in the open air in some quiet spot, covering his eyes to protect them from the light, will succeed in securing several hours of refreshing sleep.

Such patients frequently require the services of a thoroughly trained nurse, who understands how to adapt the various treatments to their personal peculiarities, so that they shall tend to soothe the nerves rather than excite and irritate them, and who can at any time during the night use some of the simple physiological procedures that will coax nature to give the patient another hour's sleep.

To the discouraged patient who has been habitually using large doses of sleep-producing compounds it often seems like a useless task to abandon these drugs, especially if by adopting various physiological remedies he can get along with fewer hours of sleep at first than he did previously. Such patients should be impressed with the truth that Dr. Brunton, of London, has so emphatically called attention to,—that a couple of hours of natural sleep is worth more than a *whole night* of enforced nonexistence, produced arbitrarily by drugs; and that if he perseveres, he will soon acquire such a degree of health that his system will normally demand the natural amount of sleep.

The Treatment of Erysipelas. — N. G. Keirle (*Philiadelphia Medical Journal*, Feb. 16, 1901) offers the following method for the treatment of this affection: —

The affected area is first inclosed in a painted ring of tincture of iodine. The ring is not to be started at the margin of the reddened area, but from two to three inches from it, and a sufficient number of coats should be applied to cause a slight desquamation of the upper layers of the skin. At the same time the whole surface inclosed in the ring is to be covered with an ointment of ichthyol, about one dram to one or two ounces of vaseline. This is covered with a piece of gauze, and a hot stupe applied, and changed about every four hours. At the end of twelve hours, the ichthyol ointment is washed off, and a fresh coat applied, and if the iodine has not had sufficient effect, one or two more new coats are applied. — *Medical Age.*

Experiments to Explain Autointoxication and Its Treatment.— Blum (*Virchow's Archiv. f. Pathol. Anat.*, etc., Bd. 162, Heft. 3), after experimenting upon a large number of dogs, seems to have obtained results which may greatly modify our ideas of the physiology of the thyroid gland. Of those animals that were fed exclusively upon meat before and after the thyroid was removed, ninety-six per cent died, mostly of tetany. The remaining four per cent seemed immune to the results of the lost thyroid, and also to the toxins elaborated from the foods. Of those animals fed exclusively upon milk for some time before and after the operation, only sixty per cent died. If, after they remained healthy upon the milk diet for some time, they were fed meat, they exhibited all the symptoms of thyreopriva; but if kept upon a diet of milk, bread, and meat, they remained perfectly well.

The author believes that a poison from the meat is formed in the gastrointestinal tract. As a number of animals died upon a milk diet, he supposes that the same poison is formed in that as in meat, but that it is generally less. This poison is called "enteroptoxin." However, he does not explain why sucking puppies always died after removal of the thyroid, though their diet was exclusively milk. All the animals that survived did so apparently as a result of the formation of an antitoxic substance in their blood serum, for if the serum from them was injected into others suffering from thyroid cachexia, they were preserved for some time.

From these experiments it appears that the functions of the thyroid gland are to neutralize the toxins circulating in the body, and from them form the thyreotoxalbumin which has an affinity for iodine. Under certain conditions the thyreotoxalbumin is itself toxic, though many animals are immune to it, or have the power of becoming so, but do not possess an immunity to enterotoxin alone. Therefore the symptoms of thyreopriva are due not so much to autointoxication as to a saturation of the system with toxic substances formed in the intestines, and under these conditions the poisons may be diminished as much as possible by resorting to a milk diet.—*Medical Age, March 25, 1901.*

A New Sensitive Sugar Test.— Riegler (*Deut. Med. Woch.*, Jan. 17, 1901) reports an improvement upon the phenylhydrazin test. He places a pinch of crystal sodium acetate and pure white phenylhydrazin hydrochlorate in a porcelain dish, and adds one cubic centimeter of urine, brings it to a boil, and adds ten cubic centimeters of normal sodium hydrate solution. If a red-violet appears within a minute, sugar is present. If there is no sugar present, a pinkish color appears in fifteen to thirty minutes.— *Medical Age.*

TRANSLATIONS AND ABSTRACTS.

[THE articles in this department are prepared expressly for this journal.]

THE RESULTS OF THE ANTITOXIN TREATMENT IN DIPHTHERIA.

WHILE the treatment of diphtheria by antitoxin has long since passed the experimental stage, and new reports but increase one's conviction regarding its efficacy, it is still a pleasure to read the splendid report by Otto Jelinek, of the State Institute for the Preparation of Diphtheria Antitoxin in Vienna, which has just come to hand as a reprint from *Das Osterreichsche Sanitatswesen*, No. 52, 1900.

The report, designed to be as complete as possible, concerns itself with a collation of the published reports of all observers in all parts of the world to the close of 1898. Its completeness and extensiveness are apparent from the fact that it comprises 586 references to reports published in Austria, Hungary, Bosnia, Germany, France, Italy, England, Russia, Switzerland, Holland, Belgium, Denmark, Norway and Sweden, Spain, Portugal, Roumania, Turkey, Egypt, United States of America, Canada, Cuba, India, Japan, and Australia. In all these are reports of 52,785 cases with 8,525 deaths, a mortality rate of 16.15 per cent. Of these there were treated in hospitals, 35,095, with 6,389 deaths, a mortality rate of 18.23 per cent; and in private practice and partially also in hospitals, 19,647 with 2,429 deaths, a mortality rate of 12.16 per cent. To these Jelinek has added a number of collective reports from Austria, Hungary, Bosnia, Germany, Belgium, Russia, and the United States of America — 127,359 cases with 18,088 deaths, a mortality rate of 14.2 per cent.

An extremely interesting table is that which shows the influence of the early treatment with antitoxin upon the mortality rate. Thus of a total of 52,521 cases with 8,026 deaths, a mortality rate of 15.28 per cent, there were treated on the first day 5,970, with 304 deaths, a mortality rate of 5.07 per cent; on the second day, 17,088, with 1,451 deaths, a mortality rate of 8.49 per cent; on the third day, 13,203, with 2,055 deaths, a mortality rate of 15.56 per cent; on the fourth day, 6,744 with 1,576 deaths, a mortality rate of 23.36 per cent; on the fifth day, 4,238, with 1,286 deaths, a mortality rate of 30.02 per cent; after the fifth day, 3,313, with 924 deaths, a mortality rate of 27.89 per cent; and on some days not specified, 1,956, with 430 deaths, a mortality rate of 15.28 per cent.

With regard to the ages of the patients, it is noteworthy that under two years of age there were 4,264 cases, with 1,442 deaths, 33.81 per cent (under one year of age, 773 cases, with 305 deaths, 39.45 per cent); from two to five years of age, 11,353 cases, with 2,165 deaths, 19.06 per cent; from five to ten years of age, 9,628 cases, with 1,120 deaths, 11.63 per cent; over ten years of age, 5,929 cases, with 350 deaths, 5.9 per cent. This exhaustive study demonstrates anew what has been already conclusively shown, — that there results from the use of the diphtheria antitoxin a considerable reduction in the relative mortality from the disease. This reduction has occurred in all parts of the world, in all climates, in large cities as well as in the country, among the well-to-do and among the poor, at the commencement as well as at the termination of the epidemics of diphtheria. The single exception is found in the reports of some English observers, but their relatively poor results are attributed to inefficient serum. The study also shows conclusively the necessity of prompt treatment if the best results are to be attained. An increase in the mortality rate of 5.07 per cent when treatment is instituted on the first day of the disease to a rate of 23.36 per cent when the antitoxin is given on the fourth day, and 30.02 per cent when given on the fifth day, should certainly be sufficient to convince the most skeptical. — *American Medicine, 1901.*

The Senile Heart.— Dehio (*St. Petersburg, Med. Woch.*, No. 9, 1901) regards retardation of the circulation as the primary factor in all senile changes. This coincides with the appearance of, and is to a certain extent proportional to, the extent of arteriosclerosis. Owing to the consequent increased peripheral resistance, the senile heart does more work than a younger one, but the circulation may be slowed because even a stronger

contraction fails to overcome the resistance completely. The senile heart has, therefore, but little reserve force; though it suffices for rest, it can not adapt iself to the requirements of increased exercise.

A young and healthy heart can pump, when required, from four to thirteen times the usual quantity of blood into the aorta. This it attains partly by an increase in frequency and partly by an increase of force of the beats. A heart beating 140 times in the minute will drive twice as much blood into the aorta as one beating 70 times, provided the force of the beats remains the same, that is, it does twice as much work in a given time. If the force of the beats is also doubled, it will pump four times as much blood. The beats of the senile heart can not greatly increase in frequency without arrhythmia or tachycardia and other signs of heart failure supervening.

The writer found that a definite amount of work, which in the young raised the pulse rate from normal to 114 or 140 and caused no dyspnea, could not, as a rule, be performed by those over 60. A less amount of work produced dyspnea, due to incomplete evacuation of the ventricles and arrhythmia, but the pulse-rate seldom rose more than 10 beats in the minute, for instance, from 62 before the exercise, to 72 after it. Thus, in the aged, the heart may fail while the pulse-rate is still comparatively low. Since an increased demand on the heart is not met by a corresponding increase in rate, to do the same work stronger beats would be required than in youth. This comparative failure of acceleration during exercise is probably due to the senile heart's being largely unable to react to accelerating stimuli. If all inhibitory influences are removed by paralyzing the vagus endings by atropine, the accelerator nerves come into play, and the pulse-rate rises by 30 to 50 beats a minute in young, healthy subjects. In those over fifty, however, this action is less marked or altogether absent. The automatic energy of the senile heart is diminished; it can contract neither so frequently nor so powerfully as formerly. The anatomical cardiac changes in old age are secondary to arteriosclerosis, and consist in hypertrophy of the walls with dilatation of the cavities. The coronary arteries are constantly more or less atheromatous, and the intima and adventitia of the finest muscular branches may be greatly thickened. The finer changes consist in gradual atrophy, and disappearance of the muscular fibers. Their place is taken by fibrous tissue — there is a myofibrosis cordis, the fibrous tissue penetrating from thickened interfascicular septa even between individual muscular fibers. This change is most marked in the auricles, which may be converted into passively extensile, but no longer actively contractile sacs. — *British Medical Journal, April 26, 1901.*

Gastric Toxins. — During a recent discussion at the Société de Therapeutique upon toxi-alimentary epilepsy, Albert Robin cast doubt upon the importance and even the existence of gastric toxins, and attributed the so-called toxic symptoms of dyspeptics to gastric and intestinal reflexes. E. Cassaët (*Arch Gén. de Méd.*, March-April, 1901) reviews the whole question. He defines gastric toxins as unknown poisons which have their origin in the stomach and intestines from incomplete or abnormal transformation of alimentary substances, and which are capable of causing severe symptoms, recurring more or less frequently. Even milk may cause symptoms of poisoning in certain atonic dilated stomachs incapable of digesting it. The proofs of the activity of gastric toxins are both clinical and experimental. No one denies that the ingestion of food has occasionally an obvious relation of causality with certain symptoms, such as epileptiform attacks and delirium.

The debated question is whether the food acts by irritation or by toxemia. Cassaët states that the two occurrences have very distinct characteristics. Irritation symptoms occur rapidly soon after the food is taken. There is often a digestive aura, with intense cardialgia and activity. The symptoms disappear with the removal of the cause, as by vomiting. Toxemic symptoms, on the other hand, occur first toward the end of gastric digestion. There is a characteristic preparatory phase of inertia and somnolence. The organs of relation, the brain, nerves, and muscles, are chiefly affected. Several illustrative cases are recorded. Toxemia is almost invariably associated with hyperchlorhydria. Certain previous alternations of the alimentary tract favor

and explain the intoxication. Turning to experimental proofs, the nocivity of certain ferments — for example, pepsin and peptones — has been proved by injection into animals. Certain aliments are poisonous to individuals.

It is then rational to conclude that intermediate products between albuminoids and peptones are not inactive if absorbed. From the dilated stomachs of dyspeptics, Brieger and others have, by means of extraction with alcohol, separated a body which killed frogs in a few minutes with paralysis, anesthesia, and fibrillary contractions. Robin contends that an artificial synthetic body due to the treatment by alcohol causes the convulsive symptoms seen in experimental work. But Cassaët has obtained from the contents of a dilated stomach not only a "convulsive," but a "comatose" body; and Bénech has obtained the "convulsive" body without using alcohol, by allowing the stomach contents to stand for some time.

To complete the experimental evidence, it remains to be proved, however, that the rapidity of absorption is increased in dyspeptics, and so intermediate or abnormal bodies gain the general circulation, and that such bodies are absorbed without undergoing the elaboration necessary to render them inert. — *British Medical Journal, May 11, 1901.*

Intestinal Worms and Appendicitis.— At a recent meeting of the Paris Academie de Médecine (*Bul. de l' Acad. de Méd.*, March 26), M. Laveran presented a communication from Dr. Matignon, Physician to the French Legation at Pekin, entitled "Intestinal Helminthiasis, Food Regimen, and Appendicitis in China." In a previous communication, presented on September 21, 1897, Matignon called attention to the great prevalence of intestinal worms in China. In his recent communication he confirms his previous statements as to the frequency of worms (ascarides and trichocephali) among the Chinese and Europeans living in China. He adds, that notwithstanding this, he had never, during the four years and a half he had been in Pekin, seen a single case of appendicitis; nor had he met with any in the European population, numbering some one hundred and twenty persons, under his care. Three times he had observed (in a young Russian woman and in two missionaries) abdominal pains suggesting appendicular colic, and which seemed to him to depend on the presence of a tænia in the digestive canal, as they ceased on the expulsion of the parasite.

These facts, it was pointed out, do not contradict those lately adduced by Metchnikoff, who indeed admits that the parasites act chiefly by inoculating microbes in the mucous membrane of the intestine, and it is easily understood that the worms produce appendicitis according to the virulence of the intestinal microbes. It is possible that the microbic intestinal flora of vegetarians like the Chinese is less harmful than that of Europeans, especially all such as eat much meat.

The rarity of appendicitis in the Chinese appears to Matignon to confirm the opinion of Kreen and Lucas-Championnière as to the predisposing influence of a meat diet in the etiology of appendicitis. The Northern Chinaman feeds chiefly on vegetable substances, meat being a luxury within the reach of few. "The great majority of the population, both of the country and of the capital, consume mainly millet simply boiled in water, a little rice of poor quality, sweet potatoes (tuber of Ipomea batatas), cabbage, turnips preserved in salt, and a large amount of garlic. For bread, the Chinaman eats the flour of maize or barley, forming buns or cakes of unleavened paste, cooked by steam." This coarse and unappetizing diet appears to keep the bowels freely open.

Laveran suggests that as the question of the etiology of appendicitis has been placed in a different light by the work of Metchnikoff and Lucas-Championnière, it is desirable that an inquiry as to the etiological conditions of the disease should be carried out in all countries.— *British Medical Journal, April 27, 1901.*

A New Method of Determining Human Blood in Medicolegal Cases. — Dr. Uhlenhuth (*Deut. Med. Woch.*, No. 6, 1901) reports some interesting experiments. At intervals of six to eight days he injected about ten cubic centimeters of defibrinated ox-blood into the peritoneal cavity of a rabbit. After the fifth injection he used the serum of the animal in the following tests: He took

blood solutions of different kinds and strengths, filtered them when necessary, put two cubic centimeters of clear solution in small test-tubes, and added an equal amount of double strength saline solution (1.8 per cent). In this way he prepared absolute clear reddish blood solutions from oxen, horses, asses, hogs, rabbits, chickens, geese, pigeons, etc., and added to each of these six or eight drops of the serum of the injected rabbit. Rather quickly a marked cloudiness occurred in the ox-blood solutions, while all the others remained clear. The cloudiness became more intense, and finally settled to the bottom. Normal rabbit blood gave no cloudiness in the ox-blood solutions. He next injected human blood into a rabbit, and this serum would give a cloudiness only with human blood.

The blood of an ox, a man, and a horse, after having been dried on a board for four weeks, was dissolved in the saline solution, and each could be differentiated by these methods. The tests are very delicate, and may prove of great value in medicolegal cases, if other investigators can confirm these experiments.— *Medical Age, March, 1901.*

Osteomalacia.— M. Gayet and M. Bonnet conclude an article in the *Revue de Chirurgie* for February, as follows: 1. Osteomalacia is a trouble of nutrition of the bones, consisting of a deficiency of lime salts, and leading to softening of the skeleton. This trouble may be local or general. 2. Local osteomalacia is observed to follow traumatisms, osseous infections, and also certain nervous diseases. 3. The anatomical lesions are similar in the local and the general forms. They are not uniform, but present varieties which are not in any relation with the seeming etiology, the clinical variety, or the degree of generalization of the disease. 4. The pathogenesis has no specific character. 5. There are predisposing causes evident, related to age, sex, climate, etc. 6. The determining causes remain obscure, but the totality of facts seems to assign the greatest place to nervous troubles. 7. A plausible explanation of the satisfactory effects of castration lies in the fact that the internal ovarian secretion results in increased activity of the elimination of phosphates. *N. Y. Medical Journal, April 13, 1901.*

The Cocaine Habit.— Cocainism, says G. W. Norris (*Philadelphia Medical Journal*, Feb. 7, 1901), is the most insidious of all drug habits. The use of the drug being unaccompanied by disagreeable after-effects, — headache, nausea, vomiting, etc., which are met with after the ingestion of opium or alcohol, — the vice is readily and rapidly established.

Cocainism is occasionally acquired by the local use of the drug in diseases of the nose and throat, teeth, etc., but more often by its use as a substitute for opium or alcohol.

Cocaine is eventually tolerated by the system in huge doses. One case is recorded where sixty grains daily were consumed.

A relatively large number of habitués are found in the medical and dental profession (it is said thirty per cent).

The continued indulgence in cocaine invariably, and usually soon, leads to marasmus, with mental, moral, and nervous degeneration.

The smallest fatal dose on record is one-third grain hypodermically.

While many cases of acute intoxication are being continually reported, there are relatively few fatal cases. The majority of such are the result of large doses injected into the urethra and bladder; *e. g.*, in two cases, five and six fluid drams respectively of a five-per-cent solution into the urethra.

The amount of cocaine sold yearly is rapidly increasing, and its self-prescribed use among the laity and lower classes is becoming proportionately more frequent. — *Medical Age, February, 1901.*

The Removal of Pelvic Inflammatory Masses by the Abdomen after Bisection of the Uterus. — The advantages, according to H. A. Kelly (*Johns Hopkins Hospital Bulletin*, January, 1901), of a bisection and enucleation of the uterus as preliminary to a complete enucleation of uterine tubes and ovaries for pelvic inflammatory and other diseases by the abdominal route, are briefly recapitulated: —

1. Additional space for handling adherent adnexæ, afforded by the removal of the uterus.

2. Great increase in facility for dealing with intestinal complications.

3. Better access by new avenues from below and in front to adherent lateral structures.

4. Elevation of structures to or above the pelvic brim, or even out into the abdomen, bringing them within easy reach of manipulation and dissection.

5. The same advantage in approaching both uterine vessels by cutting from cervix out toward the broad ligaments as is secured in approaching one of them in the continuous transverse incision method.

In general, the time of the operation is shortened; its steps are conducted with greater precision; surrounding structures are far less liable to be injured. In this way there are fewer troubles and sequelæ, and the mortality is lessened. — *Medical Age.*

Staphylococcic Enteritis in Breast-fed Infants.— Moro (*Jahrbuch für Kinderheilkunde*, 1900, Band ii., S. 530) has undertaken to investigate the causation of enteritis in breast-fed babies which can not be explained by the ordinary causes due to dietetic errors in the mother or by such accidental disturbances as overfeeding or simple exposure to cold. He has examined in Escherich's clinic the stools of nurslings affected with dyspeptic troubles, and in a large number of these cases has found staphylococci.

This staphylococcic enteritis begins as an acute intestinal catarrh. Vomiting and loss of weight do not occur, and fever is rare. The stools, which are acid in reaction, are ordinarily serous, and are expelled in a jet. Recovery is the rule.

If the stools are examined by the staining method of Weigert-Escherich, it is observed that the "blue" coli bacilli which normally exist in the stools of breast-fed infants are almost entirely replaced by staphylococci. Few at the beginning of the enteritis, they increase during the progress of the trouble, and disappear as the infant recovers, when they are replaced by the blue coli bacilli. These organisms, whether white or golden, are not virulent for mice or rabbits. They manifestly come from the mother's milk, being derived from the skin or from the superficial parts of the galactophorous canals, and are swallowed with the milk. The reason why all breast-fed infants are not thus affected depends upon the number of organisms entering the milk, upon the resistance of the organism of the infant, and upon the bactericidal power of its digestive juices.—*American Journal of Medical Science, May, 1901.*

Disinfection of Typhoidal Excreta. — N. B. Gwyn (*Philadelphia Medical Journal*, January 12, 1901), after insisting upon the importance of infected typhoidal urine in the dissemination of typhoid fever, reports his results in studying the effects of various antiseptics upon urine containing typhoid bacilli. In conclusion, he states that milk of lime is not deserving of the name of disinfectant. Carbolic acid is useful only in large amounts and in strong solution if a rapid action is desired. Formalin is efficient, but very expensive for ordinary use. Bichloride of mercury, chlorinated lime, and liquid chlorides are very valuable, are very rapid in action, and are efficient in comparatively dilute solutions. For disinfection within five minutes, he states that of a 1 : 20 carbolic-acid solution one needs half the volume of the urine to be disinfected; of a 1 : 40 carbolic-acid solution one should use two thirds of the volume of urine to be disinfected; while of 1 : 1000 bichloride of mercury only one fifth the volume of urine should be used; of saturated chlorinated lime, one fortieth the volume of urine; and of liquid chlorides, two fifths the volume of urine. He states that the disinfection seemed to be quite as rapid in urines containing albumin as in those free from albumin. For irrigation of the bladder, he states that solutions of bichloride in strengths of 1 : 100, 000 to 1 : 50,000 are most successful. He considers urotrobin the only substance which produces any effect when given by the mouth.— *American Journal of Medical Science, May, 1901.*

The Pathogenesis and Treatment of Rickets.— Pritchard (*Arch. of Pediatrics*, February, 1901) states that the symptoms of rickets are such as can be explained by the presence of an excess of lactic and similar acids in the system. The excess of lactic acid is due to the ingestion of an excess of carbohydrates, or a deficiency in the relative amount of available oxygen.

Cases of rickets due to errors in diet can be successfully cured by a proper regulation of the diet. The treatment should be both prophylactic and remedial. Proper alimentation and hygiene are the chief things to be looked after. Drug medication is seldom necessary.

Endurance of Vegetarians.— Baelz, of Tokio, is reported in the *Deutsche Med. Woch.*, as having stated, at the meeting of the Berlin Medical Society, March 20, that he has found vegetarian Japanese actually more enduring than meat-eating foreigners in control tests, and the events in China have corroborated his experiences. In the interior of Japan it is impossible for the masses to procure even fish or much rice, and as the Japanese cows do not give milk, they have no butter or cheese, and the food is limited to barley or buckwheat with one-quarter rice, the soga bean, and no meat. The soga bean contains as much albumin as beef and 20 per cent oil, but the amount of cellulose renders it difficult to digest. The rich Japanese who eat rice more abundantly have soft bones, owing to the lack of lime in the rice. Children who eat much rice have grooves in their bones from the bands of their clothing, although rachitis is unknown in Japan. Among the tests of endurance he mentions that he once drove 110 km. in fourteen hours, changing horses six times. A Japanese with a cart made the trip at the same time in 14½ hours. He had two rickisha men trot 40 km. with his weight of 80 kg. every day in the heat of the sun. At the end of fourteen days one of the men had gained 5 kg. in weight. He then added a little meat to their food, but the men said it made them feel tired, so it was suspended after three days. At the end of the twenty-second day of the test, the men were as full of energy as at first.— *Journal of the American Medical Association, May 4, 1901.*

Remarks on Enteroptosis.— Dr. Max Einhorn (*Medical Record*, April 13, 1901) asserts that the corset is an important factor in the causation of enteroptosis, and he quotes from several authors to that effect. However, he also states that, in enteroptosis, some congenital anomalies are very frequently encountered. As to the frequency of enteroptosis, he quotes Glenard, who asserts that in female patients suffering from digestive disorders, about one in four is affected. It is much more frequent in women than in men. Though this condition may exist without any symptoms whatever, the patient often complains of a faint feeling or a certain weakness after rising. Frequently there is considerable fatigue after slight exertion, such as walking, and in women this is often combined with pronounced backache. A feeling of weight in the lower half of the abdominal cavity is sometimes felt, while a dragging sensation is encountered in the epigastric region. Flatulence, constipation, and frequent micturition, are also met with. If this condition is kept in mind, it is not likely to escape detection. The prognosis is good. The treatment consists in the application of a well-fitted abdominal supporter, though ample nutrition is perhaps more important than the bandage. —*New York Medical Journal, April, 1901.*

A Sign of Incipient Phthisis.— M. Boix (*Medical Press*, Jan. 30, 1901) read a paper at the last meeting of the Paris Medical Society on a sign of incipient phthisis hitherto unnoticed, that of atrophy of the scapulothoracic muscles. He said that the difficulties of a positive diagnosis of phthisis in its earliest stage are well known. The bacilli of Koch can not be discovered at that period; consequently one has to fall back on clinical signs. The symptom he referred to, although it may not be new, is not mentioned in text-books; he referred to muscular atrophy of the scapulothoracic region. That atrophy more or less general in advanced stages of affection is, on the contrary, partial in its début, involving one or other of the muscular groups, in one patient the supraclavicular hollow is more pronounced, in another the subscapular muscle is less prominent, and so on; and those differences, in comparison with the healthy side of the thorax, could be easily remarked by a careful observer.— *Medical Age, February, 1901.*

Hot Alkaline Douches in the Treatment of Inflammatory Diseases of the Uterus.—Talley (*Am. Gyn. and Obst. Jour.*, October-December) obtains satisfactory results with the hot alkaline douche in both acute and chronic inflammatory diseases of the uterus. The solution used is a dram of bicarbonate of soda to a quart of water. The temperature ranges from 110° to 123° F., beginning with 110°, and gradually increasing the temperature until 123° is reached. The douche should be continued until the parts become blanched. This treatment is repeated every 72 hours.

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

Agglutination of Tubercle Bacilli by Tuberculous Effusions.— Courmont has carried out a very extensive and careful series of studies on the agglutination power of serum from various kinds of effusion on the bacillus of tubercle (*Arch. de Méd. Exper.*, November, 1900). The greater part of his experiments deals with pleural effusion, ascitic and cerebro-spinal fluid. In the case of pleural effusion the author utilized cases of an undoubtedly tuberculous nature; secondly, those that were certainly not tuberculous; and, in a third group, those in which tubercle might possibly be the cause. He also extended his researches to an interesting group containing cases of diphtherial pleurisy in guinea-pigs, and pleurisies due to undetermined forms of micro-organisms and septic effusions of rabbits.

The results of the writer's observations led him to conclude that serum diagnosis in cases of effusion is likely to prove of immense value, and that, moreover, it is more rapid than other forms of diagnosis, such as culture or inoculation, and is not attended by any inconvenience to the patients. He more particularly concludes that non-tuberculous serous effusions do not cause agglutination or pure culture of Koch's bacillus in bouillon. As a rule, tuberculous serous effusions do cause agglutination in bouillon in proportions of 1 in 5 to 1 in 20. A certain number do not seem to show the agglutinating reaction even for 1 in 5, but generally speaking, these cases seem to be very severe or fatal, and apparently come on in patients already tuberculous, and as a final outburst.

In other cases again of undoubted tuberculous pleurisy, agglutination may not appear at first, but does so later on. The agglutinating power of the blood does not necessarily correspond with that of serous effusion. It may be more or less active, or may even be present in the absence of reaction with the fluid of effusions, and vice versa. Examination of the effusion into serous cavities experimentally produced in animals, confirms the observations on human subjects.

From a practical point of view, positive serum reaction with effused fluid constitutes a sign of the greatest value in favor of its tuberculous nature. A negative reaction only constitutes presumptive evidence against tubercle. In such a case, therefore, repeated observations should be made. The agglutinating reaction of the blood ought to be compared with that of pathological effusion.— *British Medical Journal, May 4, 1901.*

The Antagonism between the Bacillus of Eberth and the Bacillus Coli Communis.— Remy (*Ann. de l'Inst. Pasteur*, Nov. 25, 1900) concludes, as the result of an elaborate investigation, that the belief of Gaffky and Wathelet as to the destruction of Eberth's bacillus by the colon bacillus can not be sustained. Wathelet, he states, failed to find the typhoid bacillus after the cultivation of the two together, not because it was absent, but because it was in a condition difficult of detection. The common life profoundly modifies the properties of the two organisms; the typhoid bacilli losing their capacity for agglutination on addition of anti-typhoid serum; the bacillus coli being deprived after a longer time, of its specific characteristics, the formation of gas and indol. Although very difficult at first, the colon bacilli of the deeper colonies slowly grow to resemble the bacillus of Eberth, both in size and appearance. The absence of agglutination on treatment with anti-typhoid serum does not prove bacilli not to be typhoid; and bacilli with all the other characteristics of Eberth's must be considered as typhoid, if from a guinea pig inoculated with their culture, a serum can be subsequently obtained which will cause agglutination of authentic typhoid bacilli.— *British Medical Journal, April 20, 1901.*

The Presence of the Proteus Vulgaris in the Stools of Dyspeptic Infants.— Brudzinski (*Jahrbuch für Kinderheilkunde*, 1900, Band ii., S. 469) has examined the dyspeptic and fetid stools of a number of artificially fed infants in Escherich's clinic, and in all the cases found the proteus. Injected under the skin of mice, the proteus with its toxins caused death, but when cultures were mixed with the food of young dogs, kit-

tens, or mice no diarrhea or other morbid symptoms were produced.

Inquiring into the source of the contaminations, the author examined samples of the raw or boiled milk employed in the service. The proteus was found in only one instance, in a sample of boiled milk which had remained for twenty-four hours in the hospital. It was also found that in boiled milk the proteus grew well, while in fresh milk only irregularly, and in acid milk did not develop at all. The symptoms of autointoxication observed in dyspeptic children with fetid stools (pallor, weakness, loss of appetite, and weight) are attributed to absorption of toxins formed in the intestines by the proteus.

The Bacillus Coli Communis in Relation to Cystitis.—The conclusions reached by Dr. K. M. Douglas (*Scottish Medical and Surgical Journal*, February, 1901) are as follows: 1. The bacillus coli communis is met with in the great bulk of cases of cystitis, and in many is the determining cause of the disease. 2. In certain cases, the organism is abundantly present in the bladder, during long periods under favoring conditions, but without causing cystitis. 3. Certain of the facts lend support to the view that often the bacillus is a supplanter of other forms rather than the irritating cause of the disease. 4. The marked polymorphism and varying pathogenicity of the organism would account for the conflicting opinions held regarding its identity and its rôle in cystitis, and the confusion of nomenclature until recently prevailing. 5. No one culture reaction enables the organism to be with certainty recognized, but cultivation on several media is needful.

Agglutination of Colon Bacilli by Typhoid Serum.—M. Paul Courmont and M. C. Lesieur (*Presse Médicale*, Dec. 22, 1900) have found that the serum of twenty-two typhoid patients agglutinated feebly pure cultures of the bacillus coli communis, while typhoid bacilli showed the reaction in varying degrees with the same sera, usually very intense. They conclude that the serum of typhoid patients which agglutinates Eberth's bacillus, has no influence ordinarily upon the colon bacillus. When the latter shows the reaction, it is usually very feeble, and does not compare with the intensity of the agglutinative action of the typhoid bacilli.

Action of X-Rays on Microbes.—Bassett Smith (*Arch. of the Roentgen Ray*, January, 1901) gives an account of his researches on the action of X-rays and sunlight on certain pathogenic microorganisms. It was not long ago thought that X-rays had a retarding or even fatal effect on microbes. Smith found that the germs of typhoid, cholera, and Malta fever grew rapidly both in sunlight and under the X-rays. The plague bacillus, however, was killed by sunlight. This weak vitality of the bacillus pest is important, but on the other hand, it is very resisting when kept in the dark at a moderate temperature. The author mentions also Wolfenden and Forbes Ross's experiments, showing that the tubercle bacillus is not destroyed by the X-rays. With regard to the treatment of lupus by the rays, the author thinks they must act by increased stimulation of the phagocytes, rendering them more powerful in destroying the microbes.—*British Medical Journal, May 4, 1901.*

Suppuration Due to the Diphtheria Bacillus.—Adolph Hala (*Wiener Klinische Rundschau*, Dec. 9, 1900) publishes a case of what he regards as suppuration due to the diphtheria bacillus. The trouble occurred in an anemic patient who presented a small tumor at the outer angle of the eye. The skin over the tumor was dark red and smooth, and the mass presented distinct fluctuation. The tissue surrounding the tumor was infiltrated and firm, but there was no evidence of any injury to the skin. The glands at the angle of the jaw on the affected side were not involved. The tumor on the eyelid was incised, and discharged a chocolate-colored mass, accompanied by a few drops of greenish-yellow pus. The tissues of the tumor were necrotic. Micro-organisms of the pus upon cultivation gave all the characteristic cultural and staining reactions of the diphtheria bacillus.—*Medicine, March, 1901.*

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THE ENEMA.

THE COLD ENEMA.

THE enema is recognized as one of the most valuable means of reducing the temperature in febrile conditions, and not simply as an antithermic, but as a measure which aids in the removal of the causes of the abnormal temperature by exciting renal and cutaneous activity.

The cold enema was employed by the De Hahns in Germany in 1737 in the treatment of fevers. The same measure was also used by Dr. Benjamin Rush in the treatment of yellow fever in Phila delphia in 1794 with "good effects."

The enema renders invaluable service in typhoid fever, not only as a means of reducing the temperature, but of encouraging the action of the liver and kidneys, and especially in cleansing the alimentary canal. For twenty-five years it has been the custom of the writer to begin the treatment of every case of typhoid fever with copious enemas.

A simple illustration will show the efficiency of the enema as a means of lowering the temperature: Suppose, for example, the quantity of water introduced to be five pounds (pints), and the temperature 70°, the patient's temperature 105°, and his weight 150 pounds. If on the withdrawal of the water, its temperature is found to be increased to 85°, there will have been absorbed by the water 75 pounds Fahrenheit heat-units ($5 \times 15 = 75$). This would be an equivalent of one half a heat-unit to each pound of the body weight, or .5° fall in temperature for the whole body. In other words, if there had been, in the meantime, no increase of heat production, the temperature of the body would be lowered .5°.

A very convenient method of administering the cooling enema is to supplement the ordinary tube of a fountain syringe by a shorter piece of tubing, two or three feet in length, connected to it in such a way that it can be easily disconnected. The short piece of tubing should be somewhat larger than the ordinary size, so that it will not be easily obstructed. After being slowly introduced, the water should be retained for 5, 10, or 15 minutes, if possible. Then by disconnecting the short tube, and without removing the rectal tube, the water may be allowed to escape into a suitable vessel, and another portion of cool or tepid water may be immediately introduced.

In a fever case under the writer's care a number of years ago, the cold enema was employed in this manner continuously for two or three hours, with the result that the temperature of the patient, which was between 105° and 106°, and had proved refractory to every other measure, was reduced to 102°, and was thereafter readily controlled by the repetition of the same procedure.

The lower the temperature of the water employed, the greater will be the effect. Ordinarily it is not necessary to employ water at a temperature lower than 70°, and excellent effects may be obtained by means of the enema at 80°, provided a large quantity is introduced, and the measure repeated a number of times in immediate succession. To prevent premature expulsive efforts, it is well to begin at a temperature near that of the body, gradually but quite rapidly lowering it by adding cold water in sufficient quantity to produce the temperature desired. Suppose, for example, that it is desired to administer an enema of four

pints of water and to obtain the effect of water at 70°; the enema is started with a pint of water at a temperature of 100°, and three pints rapidly added at a temperature of 60°.

Stolz, in experiments to determine the antithermic effect of the cold enema in cases of typhoid fever, found that by the administration, at intervals of five to ten minutes, of the enema at a temperature of 46°, the pulse was slowed twenty to thirty beats, and the temperature taken in the mouth was lowered 3.6°.

The cold enema has rendered great service in the treatment of jaundice, as first shown by Krull.[1] The writer prefers the enema at 105° to 110°, followed by the cold enema (60°).

The cold enema is most effectual as a means of relieving constipation through its tonic effects upon the structures of the rectum and mucous membrane.

THE HOT ENEMA.

The hot enema, or hot irrigation of the colon, is a useful means of combating an inflammatory condition of the pelvic viscera. Hot water introduced into the rectum and colon is brought nearer to the ovaries and other pelvic viscera than is possible in any other way. For this purpose it may be administered three or four times a day, or if necessary, once every three or four hours. The temperature should be 110° to 120°.

Reclus prefers very hot rectal irrigation (130°) to vaginal irrigation or injection, in congestions of the pelvic viscera. It is of great value in the treatment of prostatic inflammation, causing disappearance of the swelling and pain and difficulty in micturition, often in a few hours, and in the majority of cases securing a complete cure of acute prostatitis in three to four days.

The hot enema is one of the most valuable of all hydriatic measures for combating threatened collapse in typhoid fever as well as in cholera and other conditions in which the vital failure is due to toxemia. The hot enema may be used even in cases of typhoid complicated by intestinal hemorrhage, and with marked benefit, when there is reason to believe that the patient is suffering in consequence of absorption of toxins resulting from the decomposition of retained blood clots. An immediate change in the aspect of cases of this sort is often apparent after freeing the colon of the fetid clots with a simple hot enema. The application should not be made while the hemorrhage is in progress, as the increase in arterial tension would involve serious risk. But a day or two later the bowel may be washed out without apprehension. The coloclyster, or copious enema, is the most rational method of establishing intestinal asepsis, at least when combined with an aseptic dietary of farinaceous gruels, fruit juices, and systematic water drinking.

The hot enema (104° to 115°) may be used with great benefit for its relaxing effect upon involuntary muscular tissue, in cases of hepatic or biliary colic. It is found equally useful in quieting excessive uterine pains during parturition, and in combating irregular contractions of the uterus.

The large hot enema has for many years been employed by Cantani and Wonte in the treatment of colic and infantile diarrhea. These sagacious observers also recommend its use in intestinal occlusion and pseudo-membranous colitis.

The hot enema is one of the most helpful of all measures in surgical shock and other forms of collapse. It may be safely used in all cases of shock in which the skin is pale and the pulse weak. The temperature should be from 110° to 120°. It should be followed by cold friction.

THE COLOCLYSTER OR ENTEROCLYSTER.

The purpose of this mode of applying the enema is to fill the entire colon, or at

[1] Krull, *Berliner Klin. Woch.*, 1877.

least to introduce the largest quantity of water possible without overdistending the colon. In the ordinary enema it is difficult to introduce more than a pint and a half to three pints of water; but by placing the patient in the right Sims's or knee-chest position, the amount of liquid may be increased to four or even five or six pints, and in some cases even more, without inconvenience to the patient. In the right Sims's position the water is passed upward through the sigmoid flexure, and then runs along the descending colon, and on reaching the transverse colon, follows down toward the ascending colon, in which it accumulates until the colon is gradually filled. In the knee-chest position the action of gravity is also helpful in completely filling the colon. This filling of the colon is necessary in cases in which fecal accumulations are present in the cecum; in catarrh of the cecum, a condition often mistaken for appendicitis, and which is doubtless the precursor of appendicitis in the great majority of cases; also in cases in which the cecum is infested with threadworms; and in cases of pseudo-membranous colitis.

Physiological Effects.—The physiological effects of irrigation of the intestine have been carefully studied by Krull, Stadelmann, and Kemp. Krull held the cold enema to be a powerful hepatic stimulant. Stadelmann concluded from his researches that its action is mechanical only, aiding the liver by removing from the intestine large quantities of decomposing stuffs, with swarming microbes and the ptomains and toxins produced by them. This result seems rather surprising when one considers the powerful influence upon the mesenteric circulation, of cold water introduced into the intestine. Very powerful fluxion of the liver must be excited by this measure, and the reaction following must certainly be attended by decided increase in the activity of the portal circulation.

The introduction of very hot water into the colon increases blood pressure, improves and accelerates the heart action, and produces a marked effect upon renal secretion. A temperature of 110° to 120° has been found much more effective in increasing renal secretion than a lower temperature. The author has often noted in cases of patients to whom the enema has been administered, the passage within a very short time of a large quantity of clear urine. This was observed and pointed out by the empirical hydropaths more than fifty years ago.

Cold water produces a movement of fluid toward the intestine by the reaction which follows the application. This fact renders the cold enema of value in the treatment of constipation due to excessive dryness of the fecal matters. When used for relief of an acute inflammation, as in dysentery, the application must be moderate, prolonged, and continuous.

The hot enema, on the other hand, stimulates absorption from the alimentary canal, and raises the blood pressure by filling the blood-vessels, and by reflex stimulation of the heart.

For most pronounced effects upon the heart and kidneys, the temperature should be 110° to 120°. The writer is confident that he has saved the lives of a number of persons suffering from renal suppression by the repeated employment of this simple measure during periods varying from one to three or four hours. He has used the hot enema for this purpose for more than twenty years. The effects obtained are much more prompt and in every way more satisfactory than those obtained from jaborandi or any other diuretic drug.

The ordinary hot enema at 100° to 104° produces little effect upon the blood pressure, but has a marked diuretic effect.

Cerebral congestion may result from the use of the warm-water enema, as shown by the experiments of Schüller.[1]

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[1] *Arch. für Klin., Med.* 1874.

Therapeutic Application.—The coloclyster affords marvelous relief in a class of patients, unfortunately by no means small in number, who, suffering from atony and dilatation of the colon, are always carrying about with them an enormous accumulation of fecal matters. The patients are variously classified as neurasthenics, hypochondriacs, simple dyspeptics, etc., and are treated for biliousness, insomnia, exhaustion, and a multitude of ailments, all of which conditions are the simple result of chronic autointoxication, and are promptly relieved by a cleansing bath administered to the large intestine. The quantities of fecal matter removed in these cases is sometimes enormous, and not infrequently quantities of old putrefying fecal masses, semi-hardened by long retention, make their appearance after a free coloclyster has been thoroughly administered every day for a week or more, showing that a single irrigation of the colon, no matter how thorough, is not sufficient to establish the fact of its thorough cleansing. In this class of cases, the coloclyster should be administered daily for two or three weeks if need be; or as long as the patient complains of gaseous distention of the bowels and fetid flatulence.

After the discharge of the warm water, the temperature of which should be 92° to 95°, a pint of water at 60° to 70° should be introduced and retained if possible, as a tonic bath for the colon. Care should be taken to avoid distending the colon with an excessive quantity of water at once. The amount need never exceed two quarts, and the quantity should be reduced from day to day after the colon has been thoroughly cleansed, until only a pint or a half pint of cold water is employed. Cold water stimulates and tones the bowel, whereas hot water is relaxing. The cold coloclyster may be used indefinitely without producing constipation, if the quantity of water employed is small. It acts as a sort of gymnastic trainer for the bowel, strengthening its muscular structures, and increasing the activity and energy of its controlling nerves and nerve centers.

The writer's attention was early called to the observations of Krull, already referred to, and he has for more than twenty years made use of the enema in cases of jaundice, whether suspected to be due to gall-stones, or clearly due to infection of the liver and catarrh of the bile ducts in so-called "infectious jaundice." The results have been almost uniformly excellent. Patients rarely fail to show marked improvement within a few days, and complete recovery has been secured in all cases of infectious jaundice. Careful regulation of the diet and other measures have been employed at the same time, but the coloclyster has been regarded as a measure of primary importance. The temperature for the clyster should be 90° to 100°, the purpose being to flush the portal circulation and at the same time to cleanse the alimentary canal. A much larger quantity of water can be introduced by this method than when a lower temperature is employed, and may be retained for a much longer time. A small cold enema (70°, one pint) should be injected as soon as the warm water is discharged, to counteract the depressing and relaxing effect.

The coloclyster by means of the Sims's position is an exceedingly useful measure in fevers. By placing the patient in this position a much larger quantity of water may be introduced, and in certain cases this method is one of the most effective of all means of lowering the temperature.

That many cases of intestinal obstruction may be relieved by the coloclyster properly administered, has been abundantly proved by Lesage, Von Genersch, and others. Four to six quarts of fluid are often employed. The patient should take the knee-chest, or right Sims's position, or may be inverted, and the water should be introduced with a long rectal

tube. The temperature should be 104°, and care should be taken to introduce the liquid slowly, the fountain being at an elevation of eight to twelve feet.

THE GRADUATED ENEMA.

This form of intestinal irrigation is administered in the same way as the ordinary enema or the coloclyster, and differs from it only in the fact that each day the amount of water is diminished and the temperature lowered. A very good plan to adopt is as follows: Beginning with three pints of water at a temperature about that of the body, the amount of warm water introduced each day is diminished by half a pint, one-fourth pint of cold water being added, making the total amount of the fluid one-fourth pint less each day. At the end of the twelfth day the enema will consist of four ounces of cold water. In the majority of cases the decrease in temperature will compensate in stimulating effect for the diminished quantity; so that the bowel is thus brought to a more natural state, and weaned from the necessity of distension with warm water in order to provoke an evacuative movement. The graduated enema is exceedingly useful as a means of overcoming the enema habit.

RECTAL LAVAGE OR IRRIGATION.

The author a number of years ago devised a hard-rubber instrument for this purpose, which has proved very convenient.

The temperature of the water used should be 100° to 125°, beginning with the lower temperature at first, and gradually increasing as tolerance is established. A normal saline solution, about a dram and a half to the quart, is more serviceable when the purpose is to relieve local irritation. When a cleansing effect is desired, as in catarrh of the bowels, a mixture consisting of equal parts of carbonate of soda and common salt (one dram and a half to the quart) may be used.

Hot irrigation of the rectum or the small hot enema frequently repeated, is very useful in cases of inflammation of the prostate. Hot irrigation is also valuable as a means of relieving leucorrhea, catarrh of the rectum, rectal irritation, spasm of the sphincter, and rectal ulcer.

Cold rectal irrigation is useful as a means of allaying acute inflammation (60° to 40°, 5 to 10 min.). Repeat every hour or two.

Alternate irrigation (60°, 15 secs.; 110° to 120°, 15 secs., repeating) may be usefully employed in cases of constipation due to loss of normal nerve sensibility. Employ daily, or twice daily, at night and after breakfast.

AMERICAN MEDICINE.

We are glad to welcome to the ranks of medical journalism the new magazine, *American Medicine*. The editor, Dr. Geo. M. Gould, needs no introduction to the profession. For years he has stood in the forefront as a medical author and editor.

The success achieved by other medical journals of which Dr. Gould has been editor, bespeaks success in a much larger measure for *American Medicine*, which is "founded, owned, and controlled by the medical profession of America."

Heretofore Dr. Gould has been hampered in his efforts to work out certain principles in medical journalism which were undoubtedly for the best interests of the profession, and now that these restrictions have been removed, we may expect from his hands a "clean journal," free from the stigma of the "quack advertiser" and charlatan.

The numbers of *American Medicine* which have already appeared, clearly indicate that the journal has a bright future before it, and that it is devoted to the best interests of the practicing physician.

C. E. S.

The Battle Creek Sanitarium
LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
NEWTON EVANS, M. D., Pathologist.
W. A. GEORGE, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR MAY.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	68	97	13	100	57	89	138	94
Less than 10,000 bac.	0	0	0	0	2	3	2	2
Between 10,000 and 100,000 bac.	2	3	0	0	0	0	2	1
More than 100,000 bac.	0	0	0	0	5	8	5	3
Total	70	100	13	100	64	100	147	100

The patients were received from the following States: Michigan, 36; Ohio, 15; Illinois, 14; Pennsylvania, 12; Indiana, 10; Wisconsin, 7; Iowa, 7; New York, 6; Kansas, 4; Tennessee, 4; Kentucky, 5; Arkansas, 4; West Virginia, 4; Minnesota, 3; Canada, 3; Georgia, 2; Missouri, 2; Oklahoma, 1; Washington, 1; Nebraska, 1; Texas, 1; North Carolina, 1; Louisiana, 1; Alabama, 1; Maryland, 1; Connecticut, 1.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
104 per cent.	2	0	2
100 " "	28	17	45
96 " "	39	10	49
93 " "	37	27	59
89 " "	13	20	33
86 " "	12	9	21
82 " "	1	5	6
79 " "	4	5	9
75 " "	0	2	2
71 " "	1	6	7
Total	137	96	233

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	53	20	73
Between 4,500,000 and 5,000,000	50	32	82
" 4,000,000 " 4,500,000	21	28	49
" 3,500,000 " 4,000,000	7	9	16
" 3,000,000 " 3,500,000	2	5	7
" 2,500,000 " 3,000,000	1	1	2
Below 2,500,000	3	1	4
Total	137	96	233

Urinary Laboratory.— Total number of cases 876; number of cases having albumin, 16; cases having sugar, 9; cases having casts, 7; cases having blood, 3; cases having bile, 1; cases having pus, 37; new cases, 247.

Examination of Sputum.— There were 44 examinations made, 39 being new cases.

Tubercle bacilli were found in 9 cases.

PUBLISHERS' DEPARTMENT.

THE thirty-sixth annual meeting of the Michigan State Medical Society, which convened at Battle Creek, May 15 and 16, was one of the most successful meetings ever held by this society. The weather was all that could be desired, and the citizens of Battle Creek extended a hand of welcome to the visitors. The papers read were upon practical subjects, and showed that great care had been exercised in their preparation.

During the afternoon of the first day, Dr. Kellogg demonstrated the method of shortening the round ligaments under spinal anesthesia, in the Sanitarium Hospital. Dr. Haughey, of Battle Creek, also demonstrated his method of closing an abdominal wound by means of his "ideal suture." After this the members of the Society were shown in groups about the Battle Creek Sanitarium. Many of the physicians who send patients here, and who knew of it only by reputation, had an opportunity to observe for themselves the methods used in the treatment of disease at this successful institution.

After visiting the various departments, over two hundred and fifty sat down to the tables in the magnificent dining-room of the Sanitarium, where they satisfied the "Inner man" with a choice variety of foods prepared wholly from fruits, grains, nuts, and vegetables. Many were the expressions of surprise that such a sumptuous repast could be prepared without the use of animal foods. At 10 P. M. a banquet was given in the Phelps Sanatorium.

Various points of interest in and about Battle Creek were visited, trolley rides to Gull Lake and Lake Goguac being among the many features which added to the pleasure of the visitors.

The officers elected for 1901–1902 were: Dr. Leartus Connor, of Detroit, President; Dr. A. P. Biddle, Detroit, Secretary; Dr. Chas. E. Hooker, Grand Rapids, Treasurer.

Port Huron was selected as the place of meeting for next year.

This Month and the Next.

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A Concentrated Artificial Gastric Fluid containing all the elements essential to Gastric Digestion.
One teaspoonful of this preparation will completely digest 3000 grains of freshly coagulated and disintegrated egg albumen. It also contains the milk-curdling ferment naturally associated with pepsin in the gastric fluid and may therefore be advantageously employed in the preparation of junket, curds and whey. One teaspoonful will curdle two pints of warm milk. Combined aromatics impart to the cordial the properties of a grateful stimulant, capable of increasing natural secretion of gastric fluids.
This preparation has almost entirely superseded elixirs and wines of pepsin, which generally possess very little digestive power and are prone to rapid deterioration.
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Fluid Indian Cannabis, - 40 minims.
Chloroform, - - - 40 minims.
Oil Peppermint, - - - 1/2 minims.
Tincture Capsicum, - - 1/4 minims.
Hydrocyanic acid, diluted, 9 minims.
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In pint, half-pint, and quarter-pint bottles, also ounce vials.

PEPSIN CORDIAL.

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ORIGINAL ARTICLES.

THE HYDRIATIC TREATMENT OF CHRONIC DISORDERS.[1]

BY J. H. KELLOGG, M. D.,

Superintendent of the Battle Creek (Mich.) Sanitarium.

THE value of the hydriatic method in the treatment of typhoid fever is no longer a matter of discussion with scientific physicians. Brand, Liebermeister, Ziemssen, Bouchard, and a host of other champions of this method have so ably presented its merits, and statistics gathered in American as well as European hospitals have so invariably shown the enormous superiority of the hydriatic method over either the expectant method or the use of medicinal antipyretics, that there is no longer any room for question that water, though the simplest and most readily accessible of all therapeutic agents, is at the same time the most potent of all life-saving measures which can be employed in the treatment of this exceedingly common and much-dreaded disorder.

The great success achieved in the treatment of typhoid fever is leading to the gradual extension of the hydriatic method in the treatment of other acute infectious febrile diseases. Baruch in this country and a host of observers in Europe have shown the enormous reduction of mortality which may be achieved by the use of water by systematic and scientific methods in this class of diseases. Brand recently reported a series of eight hundred cases of typhoid fever treated by the hydriatic method, without a single death, and five thousand cases with a mortality of less than four per cent. Such statements made twenty years ago would have been received with silent contempt by the whole medical profession. Clemow has recently applied the hydriatic method in the treatment of the plague in the hospitals of Bombay, and with greater success than has been achieved by any other method, saving a large percentage of his cases.

The hydriatic method has not received the attention in this country which it deserves. Twenty-five years ago, when the writer reported before his County Medical Society a series of thirty-five consecutive cases of severe typhoid fever treated by the hydriatic method without a single death, much incredulity was manifested by his colleagues, and the idea was quite generally expressed that there must have been a grave mistake in diagnosis. Prejudice has gradually melted away, and at the present time many practitioners are making great use of water in the treatment of acute febrile maladies of various sorts who formerly regarded the use of this agent for other than dietetic, culinary, and detergent purposes, as altogether unscientific and smacking strongly of charlatanry. Although the value of water in the treatment of chronic maladies is still so little appreciated in America and England, in France, Germany, and Italy the hydriatic method has long been in high favor in the treatment of nervous disorders and many other forms of chronic disease. Some eighteen years ago the writer, while pursuing medical studies in Paris, found the Hôtel Charité and several other hospitals equipped with complete appliances for the administration of the douche and other scientific hydriatic procedures. Charcot achieved his greatest triumphs in the treatment of chronic nervous disorders by the use of the cold spinal douche, which from this fact has come to be quite widely known as the Charcot douche, although this procedure was used with great success by Priessnitz nearly one hundred years ago.

After the systematic employment of the hydriatic method for more than twenty-five years in the hospital and institution man-

[1] Paper read before the Pan-American Medical Congress Havana, Cuba, Feb. 4, 1901.

agement of chronic invalids of all sorts, the writer is fully persuaded that while the resources of this therapeutic system are of inestimable value in the treatment of acute disorders, they are capable of rendering equally important service in the treatment of a large number of chronic maladies. In acute disease, there is a natural tendency to recovery, so that the most that can be said of the use of water in the treatment of acute maladies is that it accelerates recovery, and renders more certain a successful issue. In chronic disease, however, the situation is very different. Nature is constantly making a curative effort, but an unsuccessful one, so that the natural tendency is for the disease to progress from bad to worse. After employing the hydriatic method in the treatment of nearly one hundred thousand cases of chronic disease, the writer feels justified in saying that this agent, more than any other known to man, is capable of effecting a complete change in the pathological picture in nearly every form of curable chronic disease, including many cases which have until recent times been considered absolutely hopeless, by so effectively re-enforcing the powers of nature as to render the previously inefficient recuperative effort efficient and successful, so that the vital struggle becomes a winning instead of a losing battle, and the result, health instead of progressive disease and finally death. Modern physiological science has taught us that neither the physician nor his remedies heal, but that the healing power is within the body itself; as an eminent European clinician has well remarked, "It is the blood that heals." Brand and his followers have shown that the success of the hydriatic method in the treatment of typhoid fever is not due to the power of the bath to lower temperature, but to the increased vital resistance and exaltation of the bodily functions which the bath induces. Increased vital resistance and improved integrity of function are the things most needful to aid the chronic invalid in his struggle for health.

In most of its therapeutic applications, water is employed simply as a means of heating or cooling the surface of the body, so that the majority of so-called hydriatic procedures might be more properly termed thermic applications. These applications produce therapeutic results chiefly through their influence upon the circulation and metabolism.

The profound effects produced upon the nervous system by the application of water to the skin enable us, through this agent, to influence every bodily function; for, as one has well said, "The nervous system dominates all the phenomena of organic life. Directly or indirectly, all depends upon it. Nothing transpires in the body of the animal without its intervention. The cells are the artisans in the organic workshop, but the nerves are the overseers."

The value of water as a therapeutic agent depends upon its efficiency as a means of producing thermic impressions. Whatever agent affects the heat-producing processes of the body, affects likewise, in a most pronounced degree, all the vital processes. As Lubansky has well said: "To touch calorification is, in a certain sense, to touch the springs of existence; and disturbance of the heat-making functions of the body produces a corresponding disturbance in the most important functions of the system. It is to create the necessity for repair, and to impress directly and profoundly the general nervous system."

The most important organic changes induced by thermic applications of heat and cold, may be briefly summarized as follows: —

1. Elevation of body temperature by hot applications is accompanied by increase of metabolism.

2. A fall of temperature resulting from an application of cold, is accompanied by decreased metabolic change.

3. Short cold applications cause rise of temperature and increase of metabolism.

4. Prolonged cold applications cause fall of temperature and diminished metabolism.

5. Short hot applications cause fall of temperature with diminished metabolism.

6. Prolonged hot applications cause rise of temperature and increased metabolism, especially in increased oxidation of albumin.

7. No disturbance of metabolism occurs as the result of baths at neutral temperatures, or while the body temperature remains normal.

8. Strasser showed increased alkalinity of the blood after cold baths, and diminution after hot baths.

9. Jardet has shown that the acidity of

the urine is decreased by warm baths, and may even become alkaline.

By suitable local or localized applications, it is possible to modify the function of any and every organ of the entire body, in three ways: (1) By influencing the capacity of the blood-vessels of a part, and thus controlling the volume of blood present in it at any given moment; (2) by increasing or diminishing the activity of the small arteries and capillaries, thus increasing or diminishing the amount of blood circulating through the part; (3) by increasing or diminishing the excitability and activity of the living cells upon which the functional activity of the part depends.

The marvelous control exercised by localized cutaneous applications over the functional activity of the internal parts is due (*a*) to the reflex association of definite cutaneous areas with internal parts, and (*b*) to a remarkably complete but generally overlooked association between the blood supply of the internal viscera and the cutaneous covering of the body. The full significance of the latter fact as a means of explaining the rationale of various hydriatic applications, the writer has endeavored to make clear in his work on Hydrotherapy,[1] now in press. The details of these associations space will not permit us to describe here. It will suffice to say that every internal organ is represented in the skin by a definite area with which it is in especial reflex vasomotor and sympathetic relationship, in much the same way as every group of muscles of the body is represented by definite motor areas in the cerebral cortex. Every internal organ is also in direct or indirect (through anastomosis) vascular connection with a definite area of the skin, both venous and arterial. It is interesting to note that the venous area and the arterial area connected with a given viscus are sometimes quite widely separated. They may even be located on opposite sides of the body, a fact which may often be advantageously utilized, as in the case of the hot and cold gastric compress and the hot and cold pulmonary compress. The cold compress over the front of the chest contracts the bronchial arteries, while a fomentation or a hot compress applied to the back of the chest dilates the intercostal veins, and thus transfers away blood from the bronchial veins. Two powerful agencies are thus brought to bear at the same time in relieving pulmonary congestion.

It is not the writer's purpose to devote any considerable space in this paper to the consideration of either the general principles or the technique of the hydriatic method, but rather to call attention briefly to the therapeutic potency which this agency is capable of exhibiting in the treatment of a considerable number of important chronic ailments.

(To be Continued.)

[1] "Rational Hydrotherapy," The F. A. Davis Co., Philadelphia, Pa.

ANCIENT AND MODERN HYDROTHERAPY.

BY DAVID PAULSON, M. D.,
Superintendent of the Chicago Branch of the Battle Creek Sanitarium.

THE employment of water as a remedial agent is not a modern idea, for its therapeutic value has been recognized, either scientifically or empirically, for centuries. Of the literature on this subject, among the most interesting is a small work entitled, "The Curiosities of Common Water, or the Use thereof in Preventing Many Distempers," by John Smith, London, 1723. The author describes it as a compilation of the opinions of several eminent physicians, and also as embodying his own experience in the use of water, for a period of forty years. It is extremely interesting to note how admirably the remedies suggested therein were adapted to the diseases for which they were recommended. After nearly two hundred years of advancement and development in medical science, many of these quaint prescriptions can scarcely be improved.

The author had unbounded faith in the benefit to be derived from abundant water drinking, and upon this point he writes as follows: —

"When the best physicians are baffled by some distempers, they advise their patients to use the water of some mineral spring, tacitly acknowledging thereby that all their prescriptions may be excelled by water. They pretend, indeed, to ascribe its effects to some minerals with which the waters are tinctured. But Dr. Bay-

nard tells of a certain person who used to frequent Tunbridge, by which he found much benefit; but being hindered from going thither one season, did drink the same quantities of water taken from the pump of a spring in his own yard, which did him as much service. Whereupon he wrote thus on his pump : —

"'The pearl is a cheat;
'Tis water does the feat.'"

The author also recognizes the harm that might arise from the drinking of contaminated water, therefore he advises distillation, or sterilization by boiling.

"Those who have not the convenience of distillation, may boil it a little as they do for tea."

Notwithstanding the brilliant discoveries that have been made in bacteriology during the last quarter of a century, it would be difficult to offer more sensible advice in reference to the purification of drinking water.

How to utilize the powerful influences of short cold applications in insanity, drunkenness, and delirium, is very clearly expressed: —

"Madness and melancholy . . . may find better effects from the use of bathing in cold water than from other violent methods with which people so afflicted are now treated, for . . . that which will make a drunken man sober in a minute, will certainly go a great way toward the cure of a madman in a month. Now 'tis most certain to my own knowledge, that if a drunken man be plunged over head and ears in cold water, he will come out of it perfectly sober. And some I have known, that in such cases have been recover'd by barely washing their head sin cold water."

When the Chicago Medical Mission Dispensary was first opened, facilities were provided for the use of hydrotherapy in connection with other remedial agents, and it was soon demonstrated that a cold shower bath could, in most instances, sober up cases of profound drunkenness. One of the victims of the drink habit was so impressed by what had been accomplished for him during the few moments that he was under the spray, that he exclaimed as he stepped out of it, "You have wrought a miracle."

Frequently, patients who are suffering with coma resulting from a toxic dose of some narcotic drug, and who have failed to respond to all other means, may be aroused to absolute consciousness by spreading over the body a sheet wrung out of cold water, and following the same with vigorous friction. Frequently, this procedure can be repeated several times at short intervals with most gratifying results. It possesses this advantage over all stimulating drugs, that it does not introduce another medical substance into an organism that is already unable to attend to what it has received.

The beneficial effects which come from the vigorous application of cold water to a patient who has fainted, were recognized by our forefathers: —

"The use of cold water in swoonings is of great effect, common experience teacheth; for if a dish or cup of cold water is thrown strongly upon the face, the person in an instant will recover his senses, though for a time he seemeth dead, and perhaps might not have recovered in some cases, if cold water had not been so applied. . . . I am apt to think that some die in such a fit, when none are near to help them; and especially when so taken in their sleep, which I believe none need to fear who live temperately, or that eat no suppers, none who have refrained from suppers having been ever found to die in sleep."

From this quotation it is evident that the author recognized that the patient who was subject to fainting spells at night would be less liable to be afflicted if he refrained from eating supper. There can be no doubt that there are thousands of cases of insomnia that would be greatly benefited if they would not persist in compelling their stomachs to attempt to digest various more or less indigestible substances just prior to retiring.

As for the treatment of chronic ulcers, the author has the following to say : —

"I once knew a large ulcer in the foot, made by the running of melted brass into the shoe, that was kept in hand by a surgeon nine weeks, without any probability of healing, because of the great inflammation that attended it; but the party being a lover of angling, was persuaded to go with some others to Hackney River. Some of them went bare-legged into the water, to come to a certain hole where much fish was sometimes found. The sport was so good that the lame man, having pulled off his stockings and

plaisters, went in also, where he staid above two hours, and coming out again, he found the ulcer, which appeared very red and angry when he went in, did look pale; he put on his dressings, and came home, and in less than a fortnight his ulcer healed up, which doubtless was occasioned by the abating of the inflammation by the coldness of the water."

The effect of cold can be very much intensified by a previous short application of heat. The ideal treatment, in fact, for the majority of these chronic ulcers is the alternating hot and cold douche. In the dispensary of the American Medical Missionary College in Chicago, we frequently observe patients coming in for treatment who have had ulcers of the legs for a number of years; and by employing this method in a persevering way, they are generally entirely cured. In such cases, the tissues have become so anesthetized from the infection to which they are constantly subjected, that they have, in a certain sense, almost lost the power of normal repair. The hot and cold applications produce a sort of vasomotor and tissue gymnastics, which result in stimulating nutrition.

This writer had made a valuable observation in reference to the immediate treatment of burns and scalds:—

"Water I have found by long experience to be of excellent use in burns and scalds; for in all burns and scalds that are slight, if the part is plunged immediately into cold water, the colder the better, the pain will instantly be taken off. . . . And if the burn be so considerable that other remedies must be applied, none of which will take off the smart of themselves in less than two or three hours; yet if you apply cold water presently, after other applications are made to the part, the pain will immediately cease. . . . Besides it is a remedy everywhere ready at hand, which can not be said of any other; which generally requires so much time to get it ready, that much pain will be endured, if blisters do not arise, which do much increase the trouble. If the part burnt or scalded can not be dipped in water, you may apply water to it, with double linen cloths dipped therein, and new dipped as they grow warm; by which means I have cured burns and scalds in the face without blistering, when applied immediately, before blisters did arise."

Upon the same subject, Dr. Kellogg, in his "Rational Hydrotherapy," states the following:—

"The analgesic effect of cold applications is well illustrated in the use of a continuous cold compress in the case of burns. On one occasion in which the author was involved in a serious railway wreck in a Mexican desert, he succeeded in bringing almost immediate relief to two badly scalded porters by wrapping their burned legs in wet sheets, which were kept cool by pouring water over them continuously. In ten minutes the poor fellows, who had been writhing and groaning in agony, were almost entirely at ease, and both secured a good night's rest."

There are multitudes, even in this enlightened age, who, in a most superstitious manner, pin their faith to the supposed efficacy of some patent medicine to cure strained ligaments or sprained joints, when, in the majority of instances, the medicinal substance that is applied, is so inert that it can not possibly produce any physiological effect whatever. Consequently, whatever beneficial result is received must necessarily be derived from the amount of rubbing that is done in applying the liniment.

The value of cold water in producing contraction of the blood-vessels, to prevent inflammation, and arouse the reparative forces in the tissues, was evidently well recognized by this observer:—

"As for strains and sprains in the joints, cold water affords the best and most speedy remedy, as Van Heydon affirms; who saith, that by bathing in cold water all harm so received may, by this remedy, be cured more safely and more speedily than by any other, without loss of time, cost, or trouble; for no more is to be done, as I have often found, than, as soon as can be, to put the part into a tub of cold water for about two hours, which will prevent all swelling and pain. . . . And if it should be in the shoulder or any other part, which is so hurt, that can not well be immersed in water after this manner, water may be applied by dipping towels folded up into it, and laying them to the part."

The description of one of the procedures for preventing cold is condensed into one brief sentence, but it contains a truth which has been very largely ignored or overlooked in modern times:—

"Washing the bare breast every morn-

ing with cold water will make those hardy who before were apt at every turn to take cold."

In reference to inflammation of the eyes, the following is suggested:—

"I know a person who had often been subject to blood-shot or inflamed eyes, who afterward, upon the beginning of the same distemper, took, by advice, a ball of linen rags, dipt them in cold water, and applied them to the part, cooling them by new dipping as oft as they grew hot: which application was continued three hours. . . . The party, to my knowledge, hath had no sign of that distemper since, though the same had been very troublesome many times before."

It is not likely that this author had learned that cold was especially applicable for superficial inflammations, while deep seated inflammations can be much more readily benefited by hot applications. When the eyelids are the seat of inflammation, the cooling compress will almost invariably give the desired relief; but if the eyeball itself is the seat of the inflammatory process, the applying of cold to the superficial areas will only increase the difficulty, because the blood supply of the eyelids, eyebrows, and portions of the cheeks is furnished by branches of the ophthalmic artery; and so a cold application, by contracting these superficial branches, would only tend to force more blood into the other branches which supply the eyeball, thus really aggravating the difficulty. The rational thing to do in such a case is to apply hot applications over the eyelids, brow, and cheek, which will dilate the superficial blood-vessels, thus tending to divert some of the blood from the ciliary branches of the ophthalmic which supply the eyeball.

The hydrotherapeutic treatment for nosebleed leaves but little to be improved upon: —

"Dangerous bleedings at the nose have also been cured with cold water largely drank, syringing cold water up their nostrils, and applying towels round their necks dipped in cold water, changing them as they grow warm. . . . The coldness of the water syringed up the nose, so contracts the mouths of the veins which bleed, that it will put a stop to the bleeding. Such bleedings have also been stopped by dashing cold water often into the face."

For the persistent insomnia which frequently accompanies febrile conditions, the following is suggested:—

"The want of sleep in fevers may be cured likewise by the application of cold water: for to a near relation, who could not sleep for three days and three nights, I ordered a towel to be several times folded up, then to be dipped in water, and a little wrung out, and so laid upon her forehead, and to be new dipped as it grew hot; which in about two hours' time so cooled her head that she fell into a sleep, and continued in it five hours: and I ordered the same to be done the next night, and with the same success."

The author, however, fell into the same error that so many nurses do who make use of the evaporating compress to the head; viz., allowing it to become warm before it is changed. By so doing, a large share of its beneficial effect is entirely lost. The object of a cold application in such conditions is to suppress reaction entirely by continuous application of cold, and when this has been accomplished, it will ordinarily secure refreshing slumber. It is very essential, in order to secure the best results from the evaporating compress to the head, that the hair should be wet thoroughly. A moist compress which only covers the forehead will accomplish but little good; or even if it envelops the entire head, but has beneath it a layer of dry hair, little good will be derived from it.

One plan that has proved extremely satisfactory in bringing many obstinate cases of malaria to a speedy termination, is to give the patient, just before the chill, a short preliminary hot bath and follow the same immediately by some short and vigorous application of cold, and then wrap him in warm woolen blankets, and surround him with bags or bottles filled with hot water. The vigorous reaction which is thus promoted will ordinarily prevent the anticipated chill; and frequently, if this is perseveringly followed up for several days, the patient will be entirely cured. In fact, there are some cases which seem to have developed a species of immunity for quinine which may be readily cured by this means. This method is largely in vogue at the present time in Germany, but two hundred years ago its beneficial effects had already been recognized, and it was employed in the following manner: —

"Drinking a pint or a quart of cold

water in bed . . . will raise a sweat without much more covering than ordinary. . . . The same taken at the beginning of the cold fit of ague, and sweating upon it, at two or three times taking, will cure that distemper."

The hydrotherapeutic treatment recommended for catarrh was of the heroic order, as the following quotation indicates: —

"I for a long time had been troubled with the running of much clear water from my nose, with great spitting of thin rheum. . . . I let a water-cock run upon the mould of my head every morning, by which, in about six weeks' time, I was eased of my trouble."

This intelligent observer had already discovered in his time what Bouchard and many other able investigators of the nineteenth century have so strongly emphasized; viz., that indigestion paves the way for many serious maladies: —

"Stomach sickness is the root or first beginning of most of the evils that afflict the body."

The dietetic advice which he gives has a remarkably up-to-date flavor. In reference to dainty foods and overeating, he states: —

"We must not indulge the cravings of a depraved appetite, as those do who eat to please their fancy, and not the necessities of nature; and when we do eat, we must not think that the more plentifully we eat, we shall be more strengthened, for it will not prove so. A little well digested will make the body stronger than the being glutted with superfluity."

He evidently recognized that there was a definite relation between diet and physical strength: —

"I have found that nothing conduceth so much to bodily strength as a stomach in right order, which requires temperance and cooling diet to bring it into order."

What the author calls a "cooling diet" is further explained in the following quotation: —

"By keeping the blood cool as well as clean, is to be understood not only moderation in diet, but to feed most on cooling food made of wheat, barley, oatmeal, rice, and ripe apples, as also on milk, which, joined with oatmeal, is the chief food of those lusty and strong men, the Highlanders of Scotland, . . . so that therewith men may subsist, though they abstain from beef, pork, and venison, and all other meats hard to digest, and drink water as the Highlanders do."

In regard to the number of meals a day, this author must have been far in advance of his time, or else the average Englishman has sadly backslidden in this respect: —

"Two meals a day is said to be sufficient for all persons after fifty years of age, and all weak people, and the omitting of suppers does always conduce much to the health of the weak and aged. . . . All that are troubled with sweating in the night, any ill taste in their mouths, belching, and troublesome dreams, must avoid suppers."

One can scarcely resist entertaining a feeling of reverence for such men, who, earlier in the history of medicine, blazed the way with only a dim torch in their hands, compared to that bright light that is now at hand for every medical man who wishes to utilize it. Some of those men who have paved the way for subsequent advancement, evidently possessed clear intuition, keen powers of observation, and a good capacity for deducing safe conclusions from the phenomena which they met in their daily experience, although they did not possess the valuable data that modern research has produced.

Treatment of Membranous Enteritis. — In an editorial which appears in the June 29th number of the *Journal of the American Medical Association*, the following treatment is recommended in cases of mucous colitis: The treatment should be directed toward correcting dietetic errors and relieving the constipation which is so common in this disorder. Substances rich in cellulose are beneficial for this condition. Mild enemata with simple infusions of warm water or with the addition of sodium chloride, sodium bicarbonate, Carlsbad salt, or aromatics, may be given. Injections of oil also give relief. For improvement of nutrition, starches and fats should be added to the dietary. The state of the nervous system should be improved by exercise, gymnastics, hydriatic measures, and the like, and a partial or complete rest cure may be valuable.

TRANSLATIONS AND ABSTRACTS.

[THE articles in this department are prepared expressly for this journal.]

The Conditions of Action of Trypsin on Fibrin. — H. M. Vernon, M. A., M. D. (*Journal of Physiology*, Vol. XXVI, No. 6), epitomizes the results of his experiments with reference to the tryptic digestion of fibrin as follows: —

"Introduce about 18 c.c. of finely chopped fibrin into a 10 c.c. graduated tube filled with water, and centrifugalize for two minutes. Carefully read off the volume of fibrin, now reduced to about 1 c.c. Replace 5 c.c. of the water by 2 per cent sodium carbonate, and allow the fibrin to swell for an hour at 38°. Then withdraw 6 c.c. of the 1 per cent Na_2CO_3, and replace it with water + 1 c.c. or less of the extract to be tested. Shake up the tube from time to time, and when all but about 4 c.c. of the fibrin has undergone solution, centrifugalize again for one minute, and read off the volume of fibrin remaining. This is now reduced to about 2 c.c., so one has determined the time of digestion of about 80 per cent of the fibrin originally taken. This time is corrected to exactly 80 per cent digestion by means of a table, and then from another table the relative tryptic value can be ascertained.

"This method is a fairly rapid one, the necessary manipulations for each estimation taking only about a quarter of an hour altogether.

"It was found that trypsin is very rapidly destroyed by sodium carbonate, an active extract kept at 38° with 4 per cent Na_2CO_3 having about 65 per cent of its ferment destroyed in an hour; 1 per cent Na_2CO_3 destroys over 80 per cent, while pure water may destroy over 30 per cent in an hour. On investigation this phenomenon in a series of glycerin, alcoholic, saline, and aqueous extracts of human, dog, pig, sheep, and ox pancreases, which had been kept for some months, it was found that only the most active (*i. e.*, least deteriorated) of these extracts showed this extreme sensitiveness to sodium carbonate, the least active, with about a hundredth the tryptic power, having only about 7 per cent of their ferment destroyed per hour by 4 per cent Na_2CO_3. Extracts of intermediate degrees of activity showed intermediate degrees of sensitiveness, or the destructive action of the sodium carbonate on the ferment diminished concomitantly with the activity of the extract. From this it seems to follow that the ferment trypsin is not a single chemical substance. It appears rather as if there were a series of 'trypsins' of gradually increasing degrees of stability, so that when an extract is kept, and gradually deteriorates, the most sensitive trypsins are first destroyed, and the least sensitive ones last.

"The law enunciated by Schultz and Borissoff, that the rate of digestion varies as the square root of the quantity of ferment present, was confirmed. It was necessary to allow for the ferment destroyed during the course of digestion."

Stereoagnosis. — Dr. C. W. Burr concludes, after discussing stereoagnosis and allied conditions (*Amer. Jour. Med. Science*, March, 1901), that: —

1. The ability to recognize objects by handling them depends upon the integrity of the afferent nerves, the cortical sensory area, and the cortical perceptive area.

2. Disease of either of these will make it impossible for the patient to recognize objects by handling them.

3. We may dismiss from consideration here the inability to recognize objects because of disease of the sensory nerves or of the sensory tracts in the spinal cord, medulla, and pons. Such inability is due to anesthesia of one or more types.

4. There is a distinct area of the cortex in which sensations produced by handling objects are grouped together to form tactile memory images, the tactile perceptive area, in the parietal lobe, which is not the same thing as the sensory area, though it may be located within the boundaries of the latter.

5. It would be well to limit the term stereoagnosis to cases in which the inability to recognize objects by contact is due to some failure of sensation caused by brain disease, either in the cortical sensory area itself or in the fibers going to it.

6. Tactile amnesia includes the case in which, on account of disease in the tactile perceptive area, the tactile memory images are destroyed. It is not in-

frequently associated with mind-blindness, and, indeed, it is probable that always in recognizing objects by handling them we recall from memory a more or less faint recollection of the visual appearance of the object. Auditory memories are less frequently recalled because less frequently needed to make a complete percept, and those of smell and taste quite readily.

7. The form of sensation most necessary for the recognition of any given object depends upon the qualities of the object. Tactile anesthesia, if sensibility to stronger pressure is preserved, causes little or no difficulty. The space sense, the localizing sense, and the sense of position are probably the most important, for by them we learn the form of objects — the most important element in recognition.

8. When in the cerebral palsies of children there is inability to recognize objects in the paralyzed hand, it is often caused, as Oppenheim states, by the fact that tactile memory images were never acquired.

9. Granting that the tactile perceptive area is not the same as the cortical sensory area, such cases as the second reported can be explained upon the hypothesis of a lesion cutting off the fibers joining the areas. — *The Alienist and Neurologist, July, 1901.*

Surgical Hints. — In cases of delirium tremens, when the action of sedative drugs is apparently insufficient to obtain rest and sleep, a blister or a mustard plaster applied to the back of the neck often has an excellent effect.

In operations on alcoholic subjects it is often necessary to watch the patient carefully, because delirium tremens may occur after any severe injury or operation, even in patients who have not touched alcohol for several weeks.

Little children should never be operated upon during very hot weather, if the surgeon can choose his own time. They are very apt at this time, however carefully fed, to develop a severe form of intractable diarrhea.

Atheroma of arteries does not contraindicate amputations so much on account of the danger of hemorrhage as because, in these cases, the flaps slough easily, owing to lowered vitality. Hence it is necessary to select the operation that will give the best blood supply.

Cancer occurring in a breast, after the other breast has been removed for this disease, ought to be operated on if there is no sign of recurrence on the operated side, because the new growth must be considered as a primary lesion rather than as a result of metastasis.

It is better to discard carbolic acid entirely in the treatment of wounds in children. Not only do they develop gangrene very readily from its continuous effect in wet dressings, but fatal cases of poisoning have been known to occur from the application of so weak a solution as 1–40.

In any operation in which muscles and fasciæ are divided, it is well to remember that these structures are apt to become further separated on account of the handling of the parts during the operation. Hence it is well, when suturing these structures, to pull the skin at the angles of the incision, in order to make sure that no divided tissues extend beyond the limits of the original incision.

In small abscesses occurring in infected wounds, whether they involve the whole or only a portion of the wound, there is no better treatment than the removal of stitches, washing out with peroxide of hydrogen, and thoroughly painting the pyogenic surfaces with tincture of iodine. — *International Journal of Surgery, May, 1901.*

The Hydriatic Treatment of Incipient Pulmonary Tuberculosis at Home. — H. Meffert (*Deutche Med. Woch.*, May, 1901) says that the value of this method of treatment has been universally recognized, and describes a simple means of carrying it out in the homes of patients. The bed is first covered with a woolen blanket sufficiently large to envelop the patient from head to foot, and on top of this are spread two smaller blankets, one long enough to reach from the chin to the hips, and the other from there to the feet. Over these a sheet is spread, and the patient is wrapped up in

the manner customary for a dry pack, lying quiet until thoroughly warm. The coverings of the upper part of the body are then loosened, and the arms and trunk rapidly sponged off by one or, preferably, two attendants, and the wrappings restored without drying, after which the lower extremities are similarly treated, the whole procedure not taking more than one minute. In this, which is virtually a wet pack, the patient is allowed to remain till he feels perfectly warm and dry again, when he is released, and is stood up by the bedside with his feet in a tub of warm water. The entire body is then showered with water from an ordinary watering-pot for a period of not more than thirty seconds, is rapidly dried, and dressed.

The treatment should be carried out twice a day, the first time in bed before rising in the morning, and the second time between four and six in the afternoon. The preliminary period of warming up is very necessary, as thereby all subsequent shock is prevented. Considerable care is also required in determining the temperature of the water to be used for the sponging and showering in each case.— *Medical Record, June 8, 1901.*

Dilatation of the Stomach.— J. H. Musser and J. D. Steele (*American Journal Medical Sciences*) conclude as follows :—

1. The symptoms upon which most reliance can be placed in determining the presence of gastric motor insufficiency are :—

(*a*) The presence of fluid and food in the stomach after fasting over night; (*b*) the ready entrance of fluid through the tube, and difficulty in the return flow; (*c*) the absence of visible gastric peristalsis; (*d*) evidences of fermentation and intoxication by the products thereof; (*e*) thirst; and (*f*) scanty and concentrated urine.

2. In determining the position and size of the stomach, by far the most certain method has been inflation by air, by means of the stomach tube; ausculatory percussion, Dehio's method, and determining the capacity of the stomach by the amount of water required to produce a sense of fullness, while signs of value may lead to error.

2. It may be inferred from the somewhat small number of cases reported by the authors, that the condition is not uncommon in students. An analysis of the etiological factors is as follows: (*a*) Myasthenia caused by chronic gastritis from abuse of alcohol and tobacco, four cases; (*b*) myasthenia from deficient innervation, two cases; (*c*) myasthenia, probably of congenital origin, one case; (*d*) myasthenia occurring in the course of acute disease, one case.— *The Cincinnati Lancet-Clinic.*

An Apparently New Form of Muscular Irritability— Contact Irritability.— Jacques Loeb (*Amer. Jour. of Exp. Physiol.*, Vol. V, No. 6, July, 1901), after an extensive series of experiments, summarizes his conclusions as follows :—

"1. Certain salt solutions (1 gram-molecule in 8 or 10 liters) bring about an apparently new form of irritability in muscles, which may be called provisional contact irritability. A muscle that has been treated in this way will contract powerfully when it passes from the salt solution to air, CO_2, oil, sugar solution, etc., or from glycerine solutions, sugar solutions to air.

"2. The salts whose solutions produce this form of irritability are (with one exception) sodium salts, whose unions are liable to precipitate calcium, namely :—

Sodium flouride	Na_2HPO_4 Sodium oxalate	Sodium citrate
Sodium carbonate		Sodium tartrate

"3. If the nerve alone (without the muscle) be put into one of these salt solutions (1 gram-molecule in 8 or 10 liters), the muscle begins to twitch in about five minutes, and finally goes into tetanus. If the nerve be taken out of the solution, the contraction ceases. Although this seems to indicate that the salts or their ions stimulate the nerve directly, it can be shown that they only modify or increase the irritability of the nerve; for when the same nerve is brought into contact with any solid or liquid body (conductor or non-conductor), the contractions of the muscle will be resumed while they will gradually cease or diminish when the nerve is again surrounded by air on all sides.

"4. The fact that certain ions are capable of bringing about forms of irritability in nerves and muscles which do not exist normally, may perhaps furnish the explanation of a number of certain morbid phenomena (neuroses, hysteria) in which the motor and sensory reactions of the patient are modified."

The Semeiological Value of the Examination of the Blood in Cancer of the Stomach.— Hartmann and Silhol (*Rev. de Chir.*, No. 2, 1901) have recently communicated to the Société de Chirurgie de Paris the results of some researches made on the blood of surgical patients. In the course of these researches they have been convinced that in cases of cancer of the stomach, an examination of the blood is more likely to prove useful than a chemical investigation of the gastric contents. The authors, in their studies, made a particular investigation on two questions: (1) the degree of anemia, characterized by diminution of the quantity of hemoglobin, which may depend on the reduction of the number of globules or on the reduced proportion of hemoglobin in their contents; and (2) the existence of leucocytosis. The presence of cancer of the stomach, it is held, is indicated by a well-marked association of decided anemia with decided leucocytosis. Anemia is marked less by the diminished proportion of the hemoglobin in the globules, than by (1) a diminished proportion of the hemoglobin in the globules; (2) by irregularities in the form of the globules, indicating a profound modification of the elasticity and texture of the red globules; and (3) by inequality in the size of those globules that are not misshapen. The leucocytosis, to have any value as a symptomatic sign, should be very marked, and should affect especially the mono-nucleated cells.— *British Medical Journal, March 23, 1901.*

Gastroptosis and Jaundice.— Dutton Steele (*University Med. Mag.*, February, 1901, p. 838) records the case of a single woman, aged thirty-seven, who had a severe abdominal attack of what might have been hepatic colic, followed by chronic gastro-enteritis. Fourteen months after the onset of symptoms, jaundice developed and steadily increased. She was the subject of gastroptosis, but not of enteroptosis, and on restoring the stomach to its place by a belt, the jaundice improved, and finally disappeared. Gastroptosis alone will not produce jaundice: experiments on the human subject showed that the bile would still flow into the duodenum when the pylorus was pulled down, and traction then made on the bile duct in the lesser omentum. If, however, the ducts are fixed by adhesions in the portal fissure, a very moderate degree of traction produced by a displaced pylorus may induce kinking of the ducts and jaundice. No reference to any case of jaundice produced by gastroptosis pure and simple is, the writer states, to be found in literature. Gastroptosis will, therefore, readily produce kinking of the ducts and jaundice in the presence of adhesions around the ducts, but can not have this effect in their absence.— *British Medical Journal, April 6, 1901.*

Spirit Bills and Hospital Mortality. — Some years ago Dr. N. S. Davis, of Chicago (*Quarterly Journal of Inebriety*), suggested that there might be found a close relationship between the mortality and the spirit bills of large hospitals. A committee has been looking up this matter, and while not ready to make a formal report, have already found some startling facts which indicate that the connection is very close, and no doubt the death-rates rise and fall with the amount of spirits used. In one metropolitan hospital, where the physicians prescribed spirits freely as tonics and stimulants in all cases, the mortality was from 3 to 5 per cent greater than in another hospital of like character whose spirit bills were half as much. In one hospital typhoid fever and pneumonia were treated very largely with spirits. The mortality was greater than in private practice, although the conditions for treatment were more favorable. One of the visiting physicians became convinced that the free use of alcohol was a large factor in these fatal cases, and gave up its use. The results were so startling that he has become an antialcoholic advocate. Several hospitals which received soldiers after the late war had widely differing statistical results, which in a large degree seemed to be due to the

treatment. There is a growing sentiment that the free use of alcohol as a stimulant is a most disastrous remedy, although the hospitals are very slow to adopt this view. We hope to publish some figures which will bring out these facts more clearly in the future.— *The Cincinnati Lancet-Clinic.*

The Recognition of Tabes Dorsalis.— Theodore Diller (*American Medicine*) gives the following symptoms, which he believes to be the cardinal ones of tabes. Named in the order of their importance, they are :—

1. Failure of knee-jerk.
2. Romberg symptoms (swaying with eyes closed).
3. Argyll-Robertson pupil.
4. Lightning pains.
5. Loss of functions of the bladder or sexual organs.

With the presence of any three of these symptoms he believes the diagnosis may be made with certainty, and in the presence of any two, with probability, when evidence pointing to multiple neuritis, paralytic dementia, or cerebro-spinal syphilis is absent.

Among the important secondary symptoms, or signs, are :—

1. Paresthesia, anesthesia, or analgesia of the legs.
2. Locomotor ataxia.
3. Transient ocular palsies.
4. Paresthesia in the ulnar distribution.
5. Optic atrophy.

With the presence of two of the cardinal signs of tabes and one of the secondary signs, he believes the diagnosis may be made with certainty, and made as most probable with the presence of two of the secondary and only one of the primary symptoms; and, indeed, it may be made with certainty in the absence of all the cardinal symptoms. Many combinations of symptoms are, of course, seen in tabes, and the evidence presented by each case should be carefully weighed.—*Medical Standard.*

Treatment of Gonorrhea and Gonorrheal Rheumatism. — (*Monatsh. f. Prakt. Dermatol.*, XXXI, 1900.) During the past two years, Dr. L. Leistikow has had occasion to treat fourteen cases of well-marked, acute gonorrheal rheumatism. Most of the cases were accompanied by high fever, which lasted from ten to fourteen days; recovery ensued in three to five weeks. In nine cases one knee joint only was affected; in the other cases the knee joints, ankle joints, or shoulder joints were the site of the attack. In twelve cases the cure was complete; in only two cases there remained an exudate with partial ankylosis, which resisted all kinds of treatment. All of the fourteen cases were accompanied by a posterior urethritis, while in most of them there was also an anterior urethritis.

The treatment in all the above cases was as follows: 10 per cent ichthyol-vasogen was gently rubbed into the affected joints several times daily; the joints were then covered with waxed linen or gutta-percha tissue, then with absorbent cotton and mull bandage. Internally, ℥ to 5 drops of ichthyol were given in plenty of water, three times daily, after meals. The urethritis was treated with irrigations of weak solutions of ichthargan. The urethritis posterior was cured in eight or ten days; the urethritis anterior had to be treated with stronger astringents.—*Journal of Cutaneous and Genito-Urinary Diseases, June, 1901.*

Jacksonian Epilepsy.—Putnam (*Phil. Med. Jour.*, June 15, 1901) presents the following views with reference to Jacksonian epilepsy : 1. Operations of many different sorts are of value. 2. The beneficial action of these operations, although complex in character, is mainly due to the induction of a temporary inhibition of the morbid action of the cortex, which permits of the establishment of a more normal tendency. 3. The removal of the apparently normal cortex is rarely advisable, and, when beneficial, acts mainly as above indicated. 4. The cause of the persistence of the "epileptic habit" is not to be sought alone in anatomic peculiarities of the brain, but it shares the vitality and independent endurance of memories in general. Also, the symptom-groups which present themselves after cortical lesions conform in general to certain special types, which recur without being closely dependent on the localization of cerebral injury. In fact, these symptom-groups represent efforts at the formation of a new equilibrium on the part of a being endowed with conscious-

ness and memory on the one hand and with a complex brain mechanism on the other.

Abnormal Stools in Infants.—Chapin (*Jour. Am. Med. Asso.*) considers the following as abnormal types: —

1. *Green Stools.*— Stools can be considered green only when that condition is evident immediately upon their passage. They are due to a fermentation, which is doubtless the result of bacterial action. All stools become green a certain time after passage, caused by oxidation of the air.

2. *Curdy Stools.*— Curdy lumps may be produced by undigested casein or fat. The former are hard and yellowish, while the latter are soft and smooth, like butter.

3. *Slimy Stools.*— These are the results of catarrhal inflammation. When the mucus is mixed with fecal matter, the irritation is high up in the bowels; but when flakes or masses of mucus are passed, the trouble is near the outlet.

4. *Yellow Stools.*— These are seen in depressed nervous conditions, especially in the hot days of summer, when the bowel is relaxed, and the inhibitory fibers of the splanchnic nerve do not act to advantage.

5. *Very Foul Stools.*—These are caused by decomposition of the albuminoid principles of the food.

6. *Profuse, Colorless, Watery Stools.*— Profuse, colorless, watery stools, with little fecal matter, are doubtless caused by an infective germ, akin to that of Asiatic cholera. This is known as cholera infantum.

It is rare to see one of these types by itself. With the exception of the last, they may be seen in all combinations.— *Texas Medical News.*

Influence of Maternal Inebriety on the Offspring.—W. C. Sullivan (*Journal of Medical Sciences*) has investigated the history of inmates of the Liverpool prison, whose mothers were chronic drunkards. He eliminated cases having other degenerative factors, and brought out the following interesting facts: The death-rate among the infants of inebriate mothers was nearly two and a half times that among the infants of sober women of the same stock. There is a decrease of vitality in the successive children of the alcoholic family; in one family the first three children were healthy, the fourth had defective intelligence, the fifth was an epileptic idiot, the sixth was dead-born, and the seventh pregnancy ended in abortion. A sensibly higher death-rate was observed in cases of early maternal inebriety. Sober paternity has little influence upon the vitality of the offspring in the face of maternal drunkenness, and might be almost neglected. Conception in drunkenness had a distinct influence, as shown by the fact that in seven cases in which the condition was noted, six of the children died in convulsions in the first months of life, and the seventh infant was stillborn.

The Toxemia of Pregnancy.—S. Marx (*Medical Record*) concludes an article on this subject as follows: —

1. Toxemia of pregnancy is a complex condition depending on more than one factor.

2. Many women go to term with albuminuria, without symptoms referable to a toxemia. When such symptoms arise, they are not caused by the albumin present, but by faulty urea secretion.

3. In the most desperate and malignant cases there is found neither albumin nor casts.

4. Urea is always found markedly diminished in the so-called true toxemias of pregnancy, or urinemias.

5. Finally, I make a strong plea for a regular and methodical course of urea estimation in all cases of toxemia, or for the relegation to secondary importance of the time-honored examination for albumin.

6. Progressive diminution of urea excretion, with or without albuminuria, is the sole indication for the induction of premature labor, which is especially indicated when conscientious medical treatment fails.— *The Medical Standard.*

Marble Dust in the Manufacture of Spices.—In visiting a "spice factory," the editor of the Philadelphia *Medical Journal* observed that "hundreds of tons of marble chippings were being pulverized and used in the manufacture of all sorts of ground spices." He also learned that floor sweepings of such factories were regular articles of commerce.

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

The Flora of the Human Body and the Evils of the Large Intestine. — E. Metchnikoff, in a lecture delivered at Manchester, states that the human body shelters from sixty to seventy different kinds of microbes. There are less on the skin than elsewhere; about thirty are found in the mouth, where their secretions attract the leucocytes, and are thus beneficial; about thirty in the stomach; fourteen in the small intestine; and forty-five in the rest of the intestines. The microbes in the gastrointestinal canal do not seem to influence digestion, but certain species evidently prevent the development of others. The cholera vibrio, for instance, kills a nursing rabbit, while it is completely harmless for the adult rabbit, after its intestines are tenanted by microbes. Most of the products secreted by the microbes inhabiting the large intestine are poisonous for the human organism, and the autointoxication may assume all forms. Even a chronic inflammation of the large arteries has been noticed in calves as the result of intestinal autointoxication. During our entire existence we have to submit to noxious action of the poisons secreted by our intestinal flora.

Attempts to sterilize the intestines have proved futile. The best means of getting rid of the microbian flora in the intestines would be to follow the example of the birds, and evacuate the contents of the intestines the moment that digestion is finished. Recent experiences have shown that persons can survive in good health after the removal of a considerable portion of the alimentary canal — four individuals are now alive whose stomachs have been removed. Ciechomski, of Warsaw, has reported the case of a woman of fifty who had carried a spontaneous abdominal fistula for more than three years without its interfering with her occupations or child-bearing. The entire large intestine was found completely atrophied.

Comparative anatomy shows that the vertebrates with the smallest amount of large intestine are the longest lived. Parrots and ravens live from sixty to one hundred years, while the horse, with its exceptionally developed large intestine, lives but twenty. Ostriches and cassowaries live only twenty-three to thirty-five years, and these are the only large birds with a large intestine. Man is not immunized against his microbian flora, and natural selection has failed to liberate him from his large intestine, which is an absolutely harmful and dangerous organ, not merely from the poisonous products of its microbian tenants, but also because it is the seat of many fatal lesions. Most of the poisons which intoxicate, which gradually enfeeble us, and which render us old before our time, originate in the large intestine.

If it is still impossible to attack the evil at its root by having the surgeon remove the large intestine, there is yet a possibility of relief by means of microbicidal and antitoxic serums, and by reinforcing the noble elements of our organs. The cytotoxins which Metchnikoff and his pupils have produced, which in large doses destroy red corpuscles, spermatozoids, kidney and liver cells, etc., injected in small doses, have an opposite effect, stimulating instead of destroying the functions of the elements in question. — *Journal of the American Medical Association, June 22, 1901.*

Production of Bacterial Disease in Rats and Mice. — In April, 1900, Professor Danysz, of Paris, published in the *Annales de l'Institut Pasteur*, an account of a micro-organism pathogenic to rats, whether given in their food or by subcutaneous injection, and presenting some resemblance to Loeffler's "mouse typhus" bacillus and to the bacterium coli bacilli, which, having once passed through an animal, killed rats in from seven to twelve days; but by successive passages through animals their virulence diminished, and finally disappeared altogether.

Professor Danysz was very successful in experiments which he made on a large scale for the destruction of rats in drains by this means, for the dead rats were eaten by others, and thus the disease was spread. With a view to testing the applicability of the method for the destruction of rats in time of plague, Dr. P. Kister and Dr. P. Köttgen, of the Public

Health Institute in Hamburg, have made a number of observations, which are published in the *Deutsche Medicinische Wochenschrift* of May 2. They, as well as Professor Danysz, found that the virulence of the bacillus for rats diminishes with successive passages through the animal organism, and after about ten passages it no longer causes death.

For their experiments they grew five cultures from the heart blood of dead animals on agar plates. The weight of an agar-plate stroke-culture mass of twenty-four hours' growth was about nine milligrams, and a rat was, on an average, given bread soaked in fluid containing one of these. These rats, after they had eaten the whole of the bread, were put in a cage with a large number of healthy rats. The latter did not fall ill if the infected rats, as they died, were immediately removed from the cage, but if food was withheld so that the dead rats were eaten by the others, the disease immediately spread, and the rats infected from the dead bodies, died in about the same time as those fed on the bread to which the cultures were added. Fowls, cats, dogs, and guinea-pigs, to which the bacilli were administered, suffered from no symptoms whatever of the illness. The rats killed in this way never showed the swellings of the lymph glands or hemorrhages in the internal organs and in the subcutaneous connective tissue, which are almost invariably found in rats that have died from the plague.—*Medical Record, June 8, 1901.*

The Transmission of Bovine Tuberculosis to Man.— An attempt has been made on the part of some to establish a differentiation between the tubercle bacilli of man, of cattle, and of birds, respectively; but the evidence seems to point to their identity, such differences as may be apparent being attributable to variations in environment. The formation of a definite opinion in this connection is of great importance, inasmuch as in accordance therewith steps will be taken to prevent infection among the three groups of animals mentioned.

To the evidence already existing in favor of the identity of the tubercle bacillus of man and that of cows, M. P. Ravenel ("Proceedings of the Pathological Society of Philadelphia," October, 1900, p. 259) adds the report of three cases of cutaneous tuberculosis in human beings resulting from inoculation with the bovine tubercle bacillus. All occurred in veterinarians, who received wounds of the hands in the course of post-mortem examinations of tuberculous animals. In the first, a nodule developed, with a tendency to ulceration, after an infection by a tuberculous cow. The growth was removed, and one section presented the histologic characters of tuberculosis, although tubercle bacilli could not be demonstrated satisfactorily. In the second case, the lesion was acquired in the course of a post-mortem examination of a goat, dead of experimental inoculation with a culture of the bovine tubercle bacillus. A nodule formed and was excised, and a portion, examined histologically, exhibited an infiltrating process encroaching on the papillary layer of the skin, and destroying some of the papillæ.

With the remainder, two guinea-pigs were inoculated subcutaneously, and several weeks later both exhibited generalized tuberculosis involving the chest cavity as well as the abdomen. In the third case, in which the tubercle resulted from infection by a tuberculous cow, the growth was removed, and tubercle bacilli were found in sections. —*Philadelphia Medical Journal.*

Bacilli Pathogenic for Rats. — Kister and Köttgen, of Hamburg (*Deut. Med. Woch.*, May 2, 1901), have been working with the bacilli that Professor Danysz, of Paris, reported a year ago as pathogenic for rats. Epidemics among field mice have been observed, and lately upon ships arriving in Bristol and Hamburg from Smyrna. So it is of great interest to know if they are the bacilli of the plague. The authors confirmed the pathogenic power of the bacilli for rats and mice, but got only negative results with birds, cats, dogs, and guinea-pigs. All the rats died in five to seven days when fed with cultures of these bacilli, white mice still earlier. However these bacilli were easily differentiated from those of the plague, and the authors believe there is no danger to be feared from them.— *The Medical Age, June, 1901.*

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THE WET-SHEET RUB AND THE DRIPPING SHEET.[1]

THIS procedure, perfected by Priessnitz, consists in a thorough rubbing of the body while enveloped in a wet sheet.

Requisites.— A linen sheet, a Turkish sheet, two towels, a tub containing hot water for the feet, a pail of water at 60° to 70°. Water at a higher or lower temperature may be employed when indicated.

Method.—The patient, being prepared, the head cooled in the usual way and protected with a cold wet towel, stands in the tub of hot water with the dry sheet wrapped about him. The attendants prepare the wet sheet, which should be wrung dry enough so it will not dry rapidly.

When the sheet is ready, one assistant, holding one end of the linen sheet properly gathered in the right hand, and seizing the upper left-hand corner with his left hand, steps in front of the patient, while the attendant withdraws the dry sheet, and steps behind to assist. The patient holds up both arms, while the attendant in front places the upper left-hand corner of the sheet under his right arm; the patient then lowers the right arm, holding the sheet in place, while the attendant passes the sheet across the front of the body beneath the left arm, which is then also lowered. The sheet is then carried around the body by the assistance of the attendant who stands behind the patient, and pulls the bottom around. As the sheet is brought across the back of the patient, the attendant in front reaches over and seizes the upper edge of the sheet just above the point of the right shoulder, and pulls it first upward, then down upon the patient's chest, while with his other hand he carries the sheet across the chest, covering the fold, and over the left shoulder, deftly tucking the corner under the edge of the sheet behind.

The attendant behind tucks the sheet between the patient's legs, which are then brought tightly together. The sheet is thus brought everywhere in close contact with the skin. As soon as the patient is thus enveloped,—an operation which should be completed in 5 to 8 seconds,—both attendants begin to rub vigorously, covering the whole surface as quickly as possible, one the legs and hips, the other the trunk and arms. The rubbing should be continued for 1 to 3 minutes, or until the sheet is everywhere thoroughly warmed. The attendant should bear in mind that *the patient is not to be rubbed with the sheet, but over the sheet, with downward percussion strokes.* The bath does not depend for its effects upon irritation of the skin by the friction of the sheet, but upon the thermic stimulation and the assistance to the cutaneous circulation afforded by intermittent pressure upon the surface vessels. The rubbing movements are made with a sort of glancing percussion stroke from above downward. Percussion may be applied over the fleshy parts. Gentle patting may be applied to parts that are sensitive to rubbing. Care should be taken that the whole surface of the body is gone over many times and in rapid succession.

The rubbing must continue with vigor during the entire application. Very strong attendants are required, as a vigorous bath-man will usually find himself quite out of breath at the end of the procedure, if he has done his duty. When the sheet is well warmed, it is dropped, the Turkish sheet thrown about the pa-

[1] Advance sheets from the forthcoming book, "Rational Hydrotherapy.

tient, and the bath completed by vigorous rubbing over the Turkish sheet, followed by dry friction with the hand, with or without oil rubbing. Sometimes a Scotch douche follows the wet sheet before the drying.

The intensity of the bath may be readily varied in a number of different ways: (1) By the temperature of the water employed; (2) by the amount of water left in the sheet; (3) by using a thinner or thicker sheet; (4) by employing two or more wet sheets in succession, changing as soon as warm; (5) by the vigor of the friction movements applied; and (6) by the duration. This fact renders the rubbing wet sheet a most convenient measure for use outside of a regular hydriatic establishment, or where convenient appliances for treatment are not at hand.

The longer the duration of the bath, the greater will be the thermic effect produced. Hence, when excitement of the nerve centers and tissue change is undesirable, the sheet should be wrung dry, the temperature of the bath should not be too low, the duration should be short, and the rubbing should be vigorous.

For very feeble patients the rubbing wet sheet may be applied in bed. Care should be taken to apply hot bags or fomentations to the feet during the application. For bed-ridden patients the sheet may be applied in much the same way as when the patient stands. The sheet being spread upon the bed over a blanket, the patient is placed upon it, and raises his arms above his head while one side of the sheet is passed across the body, the edge being tucked under the trunk and between the legs. The arms are then lowered, and the other half of the sheet is drawn across the body in such a way as to include both arms, and to cover the shoulders, the free corner being tucked well under the shoulder, and care being taken to exclude the air. The patient is then vigorously rubbed from head to foot, the whole surface being gone over as rapidly as possible. If there is a tendency at first to chill from too rapid evaporation, a warm blanket should be drawn across over the wet sheet, and the friction applied beneath it. The rubbing should continue until the whole surface of the body is well reddened and the sheet warmed, usually one to three minutes. The sheet should then be removed, and the patient at once covered with a linen or Turkish sheet and a blanket, and dried beneath the blanket.

When it is necessary to avoid retrostasis in the use of the rubbing wet sheet, as in cases of cerebral hyperemia and marked visceral congestion, the patient should stand in very hot water (104° to 109°) during the application.

The rubbing wet sheet may be applied several times daily when necessary to procure the desired effect. When a saturated sheet is employed, it is sometimes necessary to apply vigorous percussion in addition to friction in order to secure proper circulatory reaction. In applying the cold rubbing sheet, care must be taken to see that the patient's skin is in a condition to receive a cold application with benefit. If the surface is cold, it must be warmed by a hot shower or some other heating bath. The wet-sheet rub should never be given when the skin is cold, or the patient chilly or apprehensive of a chill.

The Dripping Sheet. — In giving the dripping sheet, which is a much more vigorous thermic application than the rubbing wet sheet, two or three pailfuls of water at different temperatures should be in readiness. The sheet is applied thoroughly saturated with water, and dripping. The patient is not rubbed, but vigorously spatted for 20 to 30 seconds. Then a half pailful of water at a little lower temperature than that in which the sheet was originally wet, may be poured over each shoulder, and the spatting or percussion resumed. When evidences of

reaction appear in returning warmth, another pailful of water at a still lower temperature may be poured over the patient if desired; but so vigorous an application is seldom indicated. The usual temperatures employed are 70° for the sheet, 65° for the first pail, 60° for the second pail. When higher temperatures are employed, it is difficult to get good reaction, since the exciting effect of cold is necessary to arouse the nerve centers to the degree requisite to produce the thermic and circulatory reaction which this procedure is intended to provoke.

By energetic percussion outside the sheet, the cutaneous circulation is maintained, and so the bath may be prolonged until the desired effect has been attained. Care must be taken, however, to terminate the application at once when the slightest symptoms of secondary chill appear; that is, when the patient begins to lose the sensation of glow and warmth which follow the first chill from the contact of the cold sheet, and is threatened with shivering, with goose-flesh and blueness of the skin. The full development of these symptoms should not be allowed to occur.

In cases in which it is unwise to allow the patient to stand erect, the application may be made thus: Place upon the bed a rubber sheet for protection. Spread upon this a linen sheet wet in water at 75°, and slightly wrung. Place the patient on the sheet, envelop him quickly as for a wet-sheet pack; then let two attendants proceed to encourage circulatory reaction by moderate percussion and gentle rubbing of the whole surface, giving special attention to the extremities. As sheet is warmed, cool by splashing over it water at 60° to 70°, continuing the spatting, and cooling by rewetting, until the patient begins to shiver. Then remove the wet sheet, wrap in a dry linen or Turkish sheet, cover with a woolen blanket, and after fifteen minutes take the rectal temperature. Renew when the temperature reaches 102° F.

In fever cases with extremely feeble heart, the hot reclining dripping sheet is sometimes useful as a preparation for the cold towel rub or cold friction. The sheet should be very hot, and should be applied quickly.

Physiological Effects. — This procedure slows the pulse and energizes the heart, at the same time that respiration is increased, contrary to the usual physiological law. Pleninger noted a slowing of twenty beats a minute, while respiration increased five breaths per minute. Thermic reaction is usually less marked than in the immersion bath, circulatory reaction predominating; but thermic effects are obtainable at will at any degree of intensity. As the result of an ordinary application the rectal temperature falls two tenths to five tenths of a degree, while the axillary temperature is elevated. The very pronounced and lasting circulatory reaction produced secures a vigorous cutaneous circulation and an increased rate of blood movement in the whole body. The effects of this procedure are intermediate between the douche and the wet-sheet pack; it is a sort of wet-sheet pack in the first stage, with mechanical effects added.

At the first moment, the application causes deep, gasping respiration, and sometimes slight shivering; but these sensations quickly give place to more prolonged and deeper respiratory movements, with slowed heart action and general feeling of warmth and glowing of the skin, as reaction begins. This procedure, combining, as it does, the mechanical effect of friction with the thermic effect of cold, produces at first a general contraction of the small vessels of the skin, very quickly followed by active dilatation.

During the first period of contraction there is dilatation of the vessels of the brain, lungs, and abdominal viscera, quickly followed by contraction when the blood returns to the skin with the reac-

tion. Blood pressure is increased, as is also muscular capacity, there is improved assimilation of nitrogen, with increase of appetite and temporary lowering of temperature.

The most pronounced antipyretic effects, shown by lowering of temperature, are obtained by the use of a very wet sheet, a double sheet, repeated wetting of the sheet, by prolonged application, and by the use of the dripping sheet. By means of these several variations any degree of antipyretic effect may be produced. The most pronounced excitant effects are produced by a sheet wrung dry out of very cold water. The temperature ordinarily employed is 60°, but a lower temperature may be employed with robust patients, and a higher temperature (65° to 70°) with persons who are not accustomed to the use of cold water.

Therapeutic Applications.—A most important use for the cold dripping sheet is the lowering of temperature in cases in which the cold bath can not be readily employed. It may be used in such a manner as to secure all the good effects of the Brand bath without any of the inconveniences of that procedure. The author has employed this measure, with modifications, for more than twenty-five years in the treatment of continuous fevers, with excellent results.

Wet-sheet rubbing is a most excellent tonic procedure following the heating pack, the wet-sheet pack, the electric-light bath, and sweating procedures of all sorts. It has the advantage that it may be employed almost anywhere, as no apparatus is required; hence it is an especially valuable measure for use in the home. When tonic effects are desired, the sheet should be wrung very dry out of cold water (60°).

The fact that this procedure is capable of producing both thermic and mechanical effects of the most powerful character, and the readiness with which the intensity of the application may be modified, enables the physician to produce by this simple means alone nearly all the effects obtainable by hydric applications; hence the rubbing wet sheet may be properly designated as a pre-eminently useful hydriatic procedure. If the occasion requires strong derivative effects, with the minimum amount of metabolic change, as in the case of feeble, bloodless patients, with small heat-making capacity, very thin sheets wrung very dry out of water of low temperature (50° to 60°) may be employed. The rubbing will be very vigorous and the duration short (1 to 2 min.).

If, again, it is desired to produce decidedly alterative effects, through the production of strong tonic thermic reaction, a thicker or double sheet, wrung less dry, and renewed if quickly warmed, the application prolonged to 3 or 4 minutes, affords a means for securing any degree of effect which may be desired. The continued friction of the surface maintains the movement of blood in the skin, and thus prevents the shivering and other unpleasant symptoms arising from the internal congestion, which would otherwise require a speedy termination of the application before sufficient reduction of the temperature had been secured to call forth the requisite degree of heat production and accompanying tissue change.

Further, if it is desired to produce antiphlogistic effects, the dripping sheet prolonged to 10 or 15 minutes, or the rubbing wet sheet, if sufficiently long continued, is capable of producing any degree of refrigerant effect desirable. There are few other therapeutic measures, and certainly no medicinal agent known to man, capable of producing such versatile and desirable therapeutic effects.

The rubbing wet sheet is an excellent tonic measure for those unable to endure the douche. It is especially valuable as a derivative measure in cases of *cerebral congestion* and in *disorders* of the *liver, spleen, lungs,* and *digestive viscera,* in

which congestion is a prominent symptom, as in *chronic gastritis*, *chronic bronchitis*, the chronically disordered *liver of dyspeptics*. It may also be used in some cases of chronic *congestion* of the *pelvic viscera* in which pain is not a prominent symptom.

The inactive skin of *dyspepsia*, *rheumatism*, *gout*, and *diabetes* may be excited to activity by this procedure. In cases of *anemia*, *chlorosis*, and *neurasthenia*, aged persons and feeble women, the wet-sheet rub affords an excellent tonic measure, which may be employed anywhere, and without apparatus. It is particularly valuable in relieving the passive hyperemia of so-called *chronic gastritis or gastric catarrh* and allied affections of the small and large intestines, known under the various names of *chronic enteritis*, *intestinal catarrh*, *pseudo-membranous colitis*, etc. It is applicable likewise to the *chronic splenic* and *hepatic congestions* which follow and accompany *malarial infections*. In *congestion* of the *spinal cord*, in *hypopepsia*, *apepsia*, *constipation*, *dilatation* of the *colon* and *stomach*, and most other functional disorders of the digestive organs, the powerful derivative effects of the rubbing wet sheet are indicated. The dripping sheet may be employed in all cases in which it is desirable to increase metabolic activity, as in cases of slowed nutrition (Bouchard). It is hence valuable in *obesity*, *chronic rheumatism*, *gout*, and *diabetes*. Under its influence, the dry, dingy, inactive, hidebound skin of the chronic dyspeptic and the arthritic becomes clear, transparent, supple, moist, and elastic after a daily application for a few weeks, especially when accompanied by the use of some suitable sweating procedure once or twice a week, as the electric-light or vapor bath, or the wet-sheet pack.

The wet-sheet rub affords an excellent remedy in *insomnia* due to *cerebral congestion* without special irritability of the cerebral cells. The effect of the application in stimulating circulatory reaction may be increased without thermic reaction by the addition of common salt to the water in the proportion of two pounds to the gallon (60°, 1 or 2 min.).

The rubbing wet sheet is especially indicated in insomnia when the skin of the sleepless patient is hot and dry. A temperature of 75° to 85° should be employed rather than a lower temperature, so that thermic reaction may be avoided. When the skin surface is cool, the rubbing wet sheet produces undesirable effects in insomnia, increasing the wakefulness by exciting reflexes from the skin.

In cases of *cardiac insufficiency* due to valvular disease of the heart, the rubbing wet sheet renders valuable service as a means of stimulating the peripheral heart and fixing a considerable amount of blood in the skin. The dilated central heart is thus relieved, its action is slowed and energized, the whole circulation is improved, and the author has seen not a few cases permanently helped by this means when other measures had failed to afford more than temporary relief.

It may be applied twice daily in cases of *cardiac dropsy* if the patient has a fair degree of vigor. Generally it should be preceded by a short heating of the skin by means of the electric-light bath for 3 to 5 minutes, the vapor bath for 4 minutes, or a very short hot immersion bath (104° to 106°, 2 min.). Great care must be taken to avoid weakening the heart by overheating the patient. If necessary, an ice-bag may be employed over the heart during the heating process.

Gilles de la Tourette[1] has successfully employed the rubbing wet sheet to combat the febrile symptoms which occur in *exophthalmic goiter*.

This procedure furnishes also an excellent substitute for the spray or shower douche as a means of fixing the blood in the skin after a sweating pack, a vapor or an electric-light bath, or other heating

[1] Progrés Médical, 1892, p. 101.

processes, when a douche apparatus is not available. It may be advantageously used in cases of *myxedema*, and especially during the febrile exacerbations which frequently occur in this disease.

In the adaptation of the temperature of baths to different cases, it should be borne in mind that a low temperature is necessary for good effects with wet-sheet rubbing, on account of the quick reaction required. The body is exposed during the application to the cooling effects of evaporation, which to a considerable degree interferes with reaction; hence the powerful influence of a low temperature, as well as the mechanical effects of friction and percussion, is necessary to secure the prompt return of blood to the surface after the primary contraction of the peripheral vessels occasioned by the first contact of the cold sheet with the skin. The best effects are obtained by temperatures between 50° and 60°.

Contraindications.— The principal contraindications for the rubbing wet sheet and dripping sheet are *cutaneous eruptions, extreme hyperesthesia* of the skin, *acute visceral inflammation, general neuritis*, severe *neuralgic infections* involving large nerve trunks, and such extreme feebleness of the circulation that proper reaction can not be secured. Persons who can not endure temperatures below 80° should not receive this bath, as reaction will be deficient. Other measures should be applied until reaction is improved, such as the cold wet-hand rub, cold mitten friction, and the cold towel rub.

REVIEWS.

PRINCIPLES OF SURGERY.— By N. Senn, M. D., Ph. D., LL. D., Professor of Surgery in Rush Medical College in affiliation with the University of Chicago; Professorial Lecturer on Military Surgery in the University of Chicago; Attending Surgeon to the Presbyterian Hospital; Surgeon in-Chief to St. Joseph's Hospital; Surgeon-General of Illinois; late Lieutenant-Colonel of United States Volunteers and Chief of the Operating Staff with the Army in the field during the Spanish-American War. 230 wood-engravings, half-tones, and colored illustrations, royal octavo, 700 pages; extra cloth, $4.50, net, sheep or half-russia, $5.50, net, delivered. Philadelphia: The F. A. Davis Company, publishers, 1914-16 Cherry Street.

This, the third edition of Senn's "Principles of Surgery," has been thoroughly revised, and many new additions made, among them two new chapters, one on "Degeneration," and the other on "Blastomycetic Dermatitis." Many new illustrations have also been added.

The broad field of usefulness which the two former editions of this practical work have filled bespeaks for this edition a much larger field. The large experience of the author has made it possible for him to present to the student and practitioner of medicine and surgery, this comprehensive treatise on the "Principles of Surgery." The work is undoubtedly the most scientific and practical treatise on this subject which has appeared in this country, and we heartily recommend it to students and practitioners of medicine and surgery.

INFANT FEEDING IN RELATION TO HEALTH AND DISEASE, by Louis Fischer, M. D., attending Physician to the Children's Service of the New York German Poliklinik; formerly Instructor in Diseases of Children in the New York Post-Graduate Medical School and Hospital; Bacteriologist to St. Mark's Hospital; Professor of Diseases of Children in the New York School of Clinical Medicine, etc., etc. The book contains fifty-two illustrations, with twenty-three charts and tables, mostly original. Philadelphia, Chicago: The F. A. Davis Company, publishers, 1901.

The ten years' experience of the author in connection with one of the largest children's clinics in this country, has enabled him to present in this work many valuable and practical facts pertaining to infant feeding in health and disease.

The matter of infant feeding has been one of no small import to the medical profession, and a work such as this, which gives in a detailed and scientific manner the necessary facts pertaining to this subject, will be welcomed by them.

The workmanship of the book is excellent, and we can safely recommend it as one of practical value.

PAMPHLETS RECEIVED.— "Fatty Degeneration of the Heart." Thomas E. Satterwaite, M. D., New York.

"Two Hundred and Thirty-seven Consecutive Abdominal Sections." Charles Gilbert Davis, M. D., Chicago.

"Mental Fatigue." Herman T. Lukens, California, Pa.

The Battle Creek Sanitarium

LABORATORY OF HYGIENE.

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NEWTON EVANS, M. D., Pathologist.
ELMER L. EGGLESTON, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR JUNE.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.	Total.		
	Cases	Per Cent	Cases	Per Cent	Cases	Cases	Per Cent	Per Cent
Without bacteria	60	98	10	91	39	74	109	87
Less than 10,000 bac.	0	0	0	0	0	0	0	0
Between 10,000 and 100,000 bac.	1	2	1	9	6	11	8	6¼
More than 100,000 bac.		0	0	0	8	15	8	6½
Total	61	100	11	100	53	100	125	100

The patients were received from the following States: Michigan, 18; Ohio, 13; Georgia, 2; Minnesota, 5; Pennsylvania, 8; Iowa, 3; Missouri, 4; Connecticut, 1; Indiana, 17; Ontario, 3; Illinois, 11; Wisconsin, 3; Montana, 3; Kansas, 1; Arkansas, 2; Tennessee, 5; Canada, 3; Delaware, 1; Mississippi, 1; District Columbia, 1; North Dakota, 2; Kentucky, 8; Utah, 1; Texas, 1; Alabama, 2; NewYork, 3; New Brunswick, 1; Maryland, 3. Total, 125.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
104 per cent.	11	4	15
100 " "	62	34	96
96 " "	31	35	66
93 " "	25	23	48
89 " "	10	9	19
86 " "	10	4	14
79 " "	2	3	5
71 " "	2	1	3
57 " "	1	0	1
Total	154	113	267
71 " "	2	1	3

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	71	37	108
Between 4,500,000 and 5,000,000	39	44	83
" 4,000,000 " 4,500,000	11	19	30
" 3,500,000 " 4,000,000	5	7	12
" 3,000,000 " 3,500,000	4	2	6
" 2,500,000 " 3,000,000	7	3	10
Below 2,500,000	17	1	18
Total	154	113	267

Examination of Sputum.— There were 29 examinations made, 24 being new cases.

Tubercle bacilli were found in 3 cases.

Urinary Laboratory.— Total number of specimens examined, 669; new cases, 243; number of cases having albumin, 12; sugar, 9; casts, 5; blood, 3; pus, 36.

PUBLISHERS' DEPARTMENT.

IT is announced that the dates of the next meeting of the Mississippi Valley Medical Association have been changed from the 10th, 11th, and 12th of September to the 12th, 13th, and 14th of September. This change has been made necessary because the dates first selected conflicted with another large Association meeting at the same place.

The meeting is to be held at the Hotel Victory, Put-in-Bay Island, Lake Erie, Ohio, and the low rate of one cent a mile for the round trip will be in effect for the meeting. Tickets will be on sale as late as September 12, good returning without extension until September 15. By depositing tickets with the Joint Agent at Cleveland, and paying 50 cents, the date can be extended until October 8. This gives members an opportunity to visit the Pan-American Exposition at Buffalo, to which very low rates by rail and water will be in effect from Cleveland.

Full information as to rates can be obtained by addressing the Secretary, Dr. Henry E. Tuley, No. 111 West Kentucky Street, Louisville, Ky. Members of the profession are cordially invited to attend this meeting.

Those desiring to read papers should notify the secretary at an early date.

DANGER TO THE LAITY.

THE American Medical Association has just held its annual meeting in St. Paul, Minn. During its session the American Medical Temperance Association, composed of eminent physicians and teachers in medical colleges, members of the American Medical Association, always holds one or more meetings for the special purpose of promoting scientific study and investigation into the action of alcohol in health and disease. The meeting this year shows a great advance in the scientific study of alcohol and its action on the body. In the ten

years of its existence its membership has grown to over two hundred, and the number of papers and discussions, all of a scientific and technical character, are increasing, so that literally this is the most authoritative organization studying the alcohol question in this country. Of the ten papers read at the St. Paul meeting, three of them discussed Professor Atwater's experiments and conclusions, then the following resolutions were passed as the unanimous opinion of the Association: —

"WHEREAS, The American Medical Temperance Association, the members of which are physicians and medical teachers who have devoted years to the study of alcohol and its effects, and who are conversant with the work done by scientific men the world over to determine the effects of alcohol when given in any quantity, have noted the teaching of Professor W. O. Atwater, of Wesleyan University, upon the food and medical value of alcohol as set forth by him in the pages of the influential lay press; be it—

"*Resolved*, That this Association utterly repudiates the pro-alcoholic doctrine of the said Professor W. O. Atwater as being contrary to the evidence deduced by scientific experimentation, and that his conclusions are unwarranted by the evidence resulting from his own experiments. Be it further —

"*Resolved*, That this Association regards the teaching of Professor W. O. Atwater as erroneous, and a source of danger to the laity, insomuch as such teaching contributes toward the increased consumption of alcoholic beverages by giving supposed reason for their safe use."

(Signed)
N. S. DAVIS, M. D., President, Chicago, Ill.
T. D. CROTHERS, M. D., Secretary, Hartford, Conn.

Two other papers pointed out the evils from the use of cigarettes and tobacco on neurotics and young persons. One paper critically reviewed the schoolbook teachings on alcohol, sustaining their claim to scientific accuracy in nearly all the books used.

The address of both the President and the Vice-President described the folly of efforts to check disease and degeneracy by ignoring alcohol as one of the active causes, also the conflict of experience with theory and tradition. The other papers read discussed the causes of the popularity of alcohol as a beverage, and its danger in high altitudes; also the substitutes for its use in medicine.

The value and reliability of these papers is evident from the fact that eight of the ten authors are active or emeritus professors in medical colleges, and four of them are medical journalists, two of whom are in active practice.

THE "RUDOLF VIRCHOW FUND."

TO THE AMERICAN MEDICAL PROFESSION: On Oct. 13, 1901, Rudolf Virchow will be eighty years old. When he completed his seventieth year, a fund was started in his honor to enable the great master to facilitate scientific research by establishing scholarships, and by encouraging special medical and biological studies. Contributions to that "Rudolf Virchow Fund" were furnished by those in all countries interested in progressive medicine, as an homage to the man whose name is always certain to arouse admiration and enthusiasm.

In Berlin a large committee, containing among others the names of A. Bastian, V. Coler, A. Entenburg, B. Fraenkel, O. Israel, Fr. Koenig, C. Posner, and W. Waldeyer, has been formed to call for contributions which are to be added to the original "Rudolf Virchow Fund," to increase its efficiency. The committee express the opinion that in no better way, and in none more agreeable to the great leader of modern medicine, can his eightieth birthday be celebrated, and ask for the sympathy and co-operation of all those engaged in the study and practice of scientific medicine all over the globe.

The undersigned have formed a subcommittee for the purpose of making the American profession acquainted with the intentions of the Berlin committee, and urge their colleagues to participate in honoring the man who has done more, these fifty years, than any other to make medicine a science, and international.

Subscriptions should be sent to their secretary, who will receipt therefor.

CHARLES A. L. REED, President of the American Medical Association.

HENRY P. BOWDITCH, President of the Congress of American Physicians and Surgeons.

WILLIAM K. WELCH, Johns Hopkins University.

ROBERT F. WEIR, President of the New York Academy of Medicine.

A. JACOBI, 110 West 34th Street, New York, Secretary.

CLINICAL EXPERIENCE WITH ADRENALIN, by Emil Mayer, M. D., surgeon, New York Eye and Ear Infirmary, Throat Department: Fellow American Laryngological Association, and of the New York Academy of Medicine, New York. Abstract from original paper, in the *Philadelphia Medical Journal*, April 27, 1901.

The acqueous extract of suprarenal gland is perhaps the best culture medium known. Its instability, the involved method of preparation, its unsightliness, and the inexactitude of its various strengths tend to make us welcome a preparation that is exact, stable, and above all, clean. Dr. Jokichi Takamine undertook the task of isolating the active principle of the suprarenal gland. He obtained a substance in stable and pure crystalline form, which raises the blood pressure, and which he named "Adrenalin."

The author has used solutions of Adrenalin Chloride, to 1 to 1,000, to 1 to 5,000, and 1 to 10,000; his cases were all rhinological. Blanching of tissues followed the application of the strongest of these solutions in a few seconds, and was very thorough. In no instance was there any constitutional disturbance. He has employed no suprarenal extract since, for any purpose whatever.

The effect of the solutions was not altered by their change to a pink color; they were used for six weeks. Subsequently a small amount of chloretone was added to the fresh solutions, and now there is but slight change of color and no floccules appear.

Thirty-five cases are reported in tabulated form, showing that the usual effect of the acqueous extract of the suprarenal gland was obtained. A few operative cases bled freely, but in every instance the hemorrhage was promptly checked by a second application of Adrenalin. The Adrenalin was used not only as a hemostatic, but for the relief of nasal congestion, as a diagnostic aid, and for the con-

tinuous treatment of acute inflammatory affections of the accessory sinuses.

The author arrives at the following conclusions:—

1. Adrenalin solutions supply every indication for which the aqueous extract has been used.
2. They are sterile.
3. They keep indefinitely.
4. Solutions, 1 – 1,000 are strong enough for operative work; and 1 : 5,000 and 1 ; 10,000 for local medication.
5. They may be used with safety.

In this connection it is interesting to note that E. Fletcher Ingalls, M. D., of Chicago, has had a very satisfactory experience with Adrenalin. In a paper entitled "Notes on Adrenalin and Adrenalin Chloride,"[1] he reports that he experimented with solutions varying from 1 to 1,000 to 1 to 10,000, of the Chloride of Adrenalin in distilled water or normal salt solution, and kept careful records until satisfied of its activity. In nine cases a very small quantity of a spray, of one part of Chloride of Adrenalin to 10,600 parts of water, was applied to the nasal cavities, with the effect of blanching the mucous membrane quickly, and in most cases causing contraction of the swollen tissues similar to that caused by cocaine. The first solution used was made with distilled water, and caused smarting; normal salt solution was then used as the solvent, with perfect satisfaction. The smarting may have been due to the presence of a small quantity of formalin in which the atomizer had been washed just before use.

Experiments were also made with insufflations of a dry powder consisting of 1.5 per cent (75 parts) each of biborate of sodium and bicarbonate of sodium; 3 per cent (150 parts) light carbonate of magnesium; one part of Adrenalin, to 5,000 parts sugar of milk. This powder cleared the nasal cavities when obstructed by swelling of the turbinated bodies, and diminished the secretions decidedly. A case of daily epistaxis was relieved by sprays of a 1 to 10,000 solution. Another of conjunctival congestion from overwork was entirely relieved by the instillation of a similar solution. The author has had equally satisfactory results in cases of conjunctivitis; laryngitis, acute and chronic; acute laryngitis with edema glottidis; acute coryza; chronic laryngo-tracheitis with acute exacerbation; and in preparation for operations upon the nose.

In conclusion, the following results are presented: this remedy will be of great value in the treatment of acute inflammatory affections of the nasal cavities, either in sprays of 1 to 5,000, or in powders of 1 to 5,000 or 1 to 2,500, sugar of milk. In acute coryza and in hay fever, in epistaxis from various causes, in acute inflammation of the fauces, solutions of 1 to 1,000 will have good effects. In acute or subacute laryngitis, solutions of 1 to 1,000, applied with moderate force, will give very great relief: it appears probable that vocalists may obtain sufficient relief from congested cords, for at least two or three hours, to obtain normal efficiency in the use of the voice.

In a paper read before the Chicago Laryngological and Climatological Association, W. E. Casselberry, M. D., called attention to the fact that Adrenalin Chloride Solution is clear, colorless, odorless, sterile, and stable, if protected from heat, light, and oxidation: it is non-irritating to mucous membranes. When applied locally, it exerts identically the same vaso-constrictor influence as the aqueous adrenal extract. Sprayed into the nostrils in the strength of 1 to 10,000, it produces a visible change from turgidity to compactness of the turbinated tissues, and a decided pallor of the mucous surfaces. In the strength of 1 to 1,000, or even 1 to 5,000, it has the power to limit hemorrhage during operations, and is an aid in the treatment of epistaxis. It may be substituted for cocaine in all cases in which an ischemic effect is desired, *e. g.*, to facilitate inspection of the deeper recesses of the nasal cavities and to make them more accessible. Adrenalin has little or no cerebral stimulant effect, exciting no desire for more of the drug; hence there is little risk of habit formation.

The author expresses the opinion that Adrenalin should afford relief in asthma associated with bronchitis and vasomotor paralysis, although he would expect little benefit from its use in asthma characterized by bronchial spasm. It may be formed into an ointment with vaseline, or mixed with stearate of zinc, powdered starch, or sugar of milk to make powders for nasal or laryngeal insufflation. The bibliography is very comprehensive, covering the literature of the subject down to the present date.

[1] *Journal of the American Medical Association*, April 27, 1901.

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ORIGINAL ARTICLES.

THE HYDRIATIC TREATMENT OF CHRONIC DISORDERS.[1]

BY J. H. KELLOGG, M. D.,
Superintendent of the Battle Creek (Mich.) Sanitarium.

(Concluded.)

Anemia.— That hydrotherapy is the remedy *par excellence* for anemia is clearly proved by physiological and clinical evidence. In 1893, Professor Winternitz, of Vienna, called attention to the remarkable influence of cold applications in increasing the number of blood corpuscles, both red and white, and also the amount of hemoglobin, it being noted, however, that the white blood corpuscles were increased in much greater proportion than the red corpuscles. In one case reported by Winternitz, the increase of blood corpuscles by a hot bath followed by cold was 1,860,000 per c. m. The number of white corpuscles was sometimes increased three hundred per cent. In a case observed by the writer, the increase was more than half a million. Thermes, many years before, had observed the same thing, and these observations have since been confirmed by numerous investigators. It is true, the increase in the blood count following a cold application is temporary, but by the application of carefully adapted cold baths two or three times a day, the increase rapidly becomes permanent. The writer has often seen the blood count increase at the rate of half a million a week for a number of weeks until the normal count was attained. In a case of pernicious anemia under the care of the writer and a colleague, the blood count had reached the lowest possible limit, careful counting showing only 400,000 per c. m. As the result of three months' treatment, the patient's blood count was raised to 4,250,000, at which time he was able to return to his home and to his business, and since then, now a number of months, the patient has remained in good health. At the beginning of the treatment the patient was so extremely feeble that his head could not be raised from a horizontal position without causing syncope. He could not even tolerate a thin pillow beneath his head. The measures employed were the wet-hand rub, later cold mitten friction and the cold towel rub; gradually more vigorous applications were added. The treatment was administered twice daily. The patient had a generous, but simple dietary; and massage, manual Swedish movements, and electricity were applied as soon as he was able to bear these measures; but it was clear that the principal credit for the improvement observed, must be given to the cold applications. Several similar cases might be cited.

Chlorosis and like conditions yield equally well to properly adapted hydriatic measures.

Neurasthenia.— The rational treatment for neurasthenia must in the future give large place to hydrotherapy. Graduated cold applications, especially cold mitten friction, wet-sheet rub, half bath, and spinal douche, not only temporarily increase the patient's nerve tone, quickly dissipating the languor, depression, and weakness from which these patients often suffer to such a distressing degree, but increase the ability of the nerve centers to store up energy by improving metabolism and encouraging every form of functional activity. By means of special applications, such as the revulsive compress, the ice-bag, the hot foot bath, the alternate spinal compress or douche, and similar measures, various forms of neurasthenic headache, and numerous peculiar cephalic sensations described by these

[1] Paper read before the Pan-American Medical Congress, Havana Cuba, Feb. 4, 1901.

patients, are removed with wonderful promptness. Neuralgias and various other sensory disturbances are rapidly ameliorated by revulsive applications, as the fomentation followed by the heating compress or short cold applications.

Anorexia yields to the general cold bath administered on rising and the cold bag applied over the stomach for half an hour before meals. Insomnia and distressing dreams disappear almost magically under the influence of the neutral bath at bedtime, and the moist abdominal girdle worn overnight. Reflex irritations which may be the cause of the neurasthenic symptoms, autointoxication, and other underlying pathological conditions characteristic of this disease, are equally amenable to appropriate hydriatic procedures.

Here is a typical case: Mr. X., a man of 40, who had been active in business for many years, gradually developed neurasthenic symptoms until his condition became so grave that he was no longer able to attend to his usual duties, and sought relief at the institution of which I have charge. He was brought by a friend. On examination, he was found to be mentally unbalanced. In a few hours after coming under our observation the patient became actively maniacal, so that it was necessary to isolate him. At the end of two weeks, under careful hydriatic management, the patient's mental balance was restored, and at the end of another week he was so much improved that isolation was no longer necessary, as not the slightest evidence of mental aberration remained. The patient made a very rapid recovery, and at the end of a few weeks was able to return to his home and his business, and by following a simple regimen of diet and exercise, was able to maintain himself in excellent health. Many similar cases might be cited.

Miss B., a cultured lady of 38, of highly nervous temperament, presented a typical picture of extreme neurasthenia. Numerous social and family cares had reduced her to a state of extraordinary suffering and wretchedness. The patient's nervous irritability was so excessive that almost any unusual sight or sound would cause her to fall forward unconscious in the condition which the French physicians call nervous apoplexy. The color sense was often greatly disturbed, everything at times having a decidedly reddish tinge. This symptom would appear and disappear with great suddenness. Occasionally the patient would become totally blind for a minute or two. The application of suitable hydriatic measures, and especially carefully graduated tonic treatment combined with massage and a rational dietary, restored this patient to excellent health, and she has now remained well for several years.

Drugs do this class of patients little or no good. In most cases coming under the writer's care, every sort of medicinal agent has already been tried. Hydrotherapy is a remedy of inestimable value in dealing with these unfortunate sufferers, and in connection with a proper regimen is capable of restoring to health a very large proportion of the chronic neurasthenics who are coming to constitute quite a large proportion of our city population.

The Diatheses. — In the treatment of the diatheses, the resources of hydrotherapy, when combined with proper regulation of diet, exercise, and other habits of life, are capable of meeting every important indication. In diabetes, the cold bath, especially the wet-sheet pack, the rubbing wet sheet, the half bath, and the cold douche, promote to a marvelous degree the oxidation of sugar in the blood and tissues. In fleshy diabetes, the hot bath may be advantageously used, especially the vapor bath, which encourages the elimination of sugar through the skin. The cold bath, which immediately follows, increases oxidation.

Various hydriatic applications encourage gastric and intestinal digestion, and by a general improvement of metabolism, antagonize this grave constitutional disease. The writer has often seen the quantity of sugar eliminated in twenty-four hours fall from one-half pound to a few grams in the course of two or three weeks under hydriatic management.

Obesity. — Obesity is another diathetic disorder which affords a most admirable opportunity for illustrating the scientific precision with which hydriatic measures may be adapted to pathological conditions. The obese patient, like the diabetic, suffers from an accumulation of residual tissue, but in the form of fat instead of sugar. Oxidation must be increased. Prolonged cold baths followed

by exercise with suitable regulation of diet accomplish the result desired, often in an incredibly short time. The hot bath prepares the patient to receive the cold application, the latter increases oxidation, thus diminishing weight, and at the same time lowers the temperature and increases muscular excitability and the capacity for muscular effort, as shown by Vinaj and Maggiori. The lowering of the body temperature prepares the patient for more vigorous exercise than would otherwise be possible, as the temperature is quickly raised by exercise in very obese patients, so that the patient is weakened by the undesirable oxidation of nitrogen.

Autointoxication. — Experience has abundantly shown the impossibility of dealing successfully with chronic uric-acid intoxication by medicinal agents alone. One after another, numerous newly discovered remedies have been loudly praised as panaceas for lithemia, but each has in turn been found wanting. Hydrotherapy offers, in its various heating procedures, the vapor, hot-air, Turkish, and electric-light baths, and the sweating pack, all followed by short preparatory cold applications, a rational and physiological method of dealing with this grave and increasingly frequent disorder. The hot bath, by elevating body temperature, promotes the oxidation of nitrogen. By this means the uric acid is converted into soluble bodies which are easily eliminated, thus promoting recovery in the most effective manner possible. By placing the patient upon a rational aseptic dietary, copious water drinking, combined with the hydriatic measures suggested, the symptoms of lithiasis rapidly recede, except in cases in which very marked tissue changes have occurred. In them recovery is necessarily slow, although hydrotherapy rarely fails to secure marked mitigation of the patient's suffering even in these cases.

Hypopepsia and Hyperpepsia. — Hypopepsia is temporarily benefited by the administration of hydrochloric acid, but by the cold bath, the application of the ice-bag over the stomach half an hour before meals, combined with massage and a suitable dietary, out-of-door life, and appropriate exercise, the activity of the gastric glands may be increased, and the patient thus be enabled to manufacture his own hydrochloric acid.

In hyperpepsia, also, as well as in hypopepsia, hydrotherapy is not merely a palliative, but strikes at the root of the disease. In this case, by means of repeated hot baths and especially the hot spinal and epigastric douche, the secretion of HCl is diminished, while the quality of the digestive work is improved.

Gastritis. — In chronic as well as acute gastritis, the Scotch douche, revulsive compress, and various other hydriatic procedures are capable of effecting in all ordinary cases as rapid and permanent a cure, provided, of course, the patient adheres to a regimen adapted to his case.

Enteritis. — Chronic enteritis yields slowly and surely to the persistent and persevering application of suitable hydriatic measures. It is not uncommon to see the number of stools reduced within a week from ten or fifteen to one or two in twenty-four hours.

Constipation. — Chronic constipation is another disorder to which the hydriatic method is especially adapted. The cold lumbar and abdominal douches stimulate peristalsis to a marvelous degree. The cold plantar douche and the cold douche to the legs, as well as the general cold douche, have a decided effect in the same direction; also the anal and perineal douche. In certain cases, the graduated enema may be made successful when other means fail.

Malaria. — In the malarial cachexia, as well as in acute malarial disease, hydrotherapy is a resource which may be relied upon as possessed of almost unfailing efficacy. In chronic cases of malarial poisoning, when quinia, even in large doses, fails to secure benefit, strong tonic applications of water are often most singularly successful. The writer has demonstrated this in a number of cases of persons suffering from chronic malarial infection contracted in the tropics, as the West Coast of Africa, Egypt, and the East Indies. He has also had an opportunity of testing the hydriatic method in malaria at the hydriatic institution located at Guadalajara, Old Mexico, with most pronounced success. It may be used with great advantage in connection with quinine, rendering the latter effective in small doses, when otherwise even large and often repeated doses fail.

Tuberculosis. — There is certainly no panacea for that dread disease, pulmonary tuberculosis, yet hydrotherapy has proved

a priceless boon to not a few sufferers from this dread malady. By the employment of carefully graduated cold applications, two or even three times daily, vital resistance may be greatly increased in this affection. Appetite improves, night sweats disappear, the patient gains in flesh, the blood count increases, and there is a rapid gain of strength. The chest pack relieves the cough, and diminishes expectoration when profuse. Hydrotherapy also lends itself in a most admirable way to the palliation of a multitude of distressing symptoms which accompany this disorder.

The principle of the hydriatic method is precisely the same as that which underlies the cold air or out-of-door method of dealing with this disease. The thermic impression made upon the skin arouses vital resistance, improves metabolism, awakens the dormant energies of the body, encourages elimination through the kidneys and the skin, increases the secretion of HCl, and encourages the digestive activity, and this is true whether the application is cold air or cold water. By the application of water in a precise and definite manner, thermic impressions of any desired degree of intensity may be made, and may be repeated as often as the patient's condition requires or will permit. Hydrotherapy should always accompany the cold-air or the out-of door treatment of tuberculosis. This system is unquestionably the most effective of all known means of combating tuberculosis affecting the pulmonary organs, and is almost equally valuable in other forms of tubercular disease.

Bright's Disease.— Chronic Bright's disease is a condition which is by some physicians supposed to contraindicate baths of all sorts. Certain physicians quite eminent in the profession have strongly counseled against the use of baths in this malady as likely to increase renal congestion and inflammation, and so lead to untoward results. After treating many cases of this malady, however, the writer feels justified in asserting that there is no disease in which hydrotherapy is capable of playing a more useful part than in this malady. Very cold and cool prolonged applications must, of course, be avoided, also exhausting hot applications. Short hot baths followed by very short, moderately cold applications are highly beneficial, while the prolonged neutral bath is of inestimable value as a means of encouraging renal activity without exciting or irritating the diseased parts.

Genito-Urinary Disorders. — Genito-urinary disorders in both men and women yield to the thorough application of the hydriatic method in many cases in which all ordinary means have been tried in vain. The neutral sitz bath is a most admirable means of relieving ovarian and vesical irritation. The temperature of the bath should be 93° – 96°, and the duration may be prolonged for an hour or two if necessary. Conditions of relaxation and debility require the cold rubbing sitz or tonic sitz daily.

In cases in which severe pain is present, and in irritable conditions, cold applications must be avoided. For relief of pain, short hot applications, as the very hot sitz (118° for 3 minutes), or a very hot blanket pack (20 minutes), followed by a short cold application, produces powerful revulsive and derivative effects in favor of the painful parts. Emmett long ago pointed out the great value of the hot douche or vaginal irrigation.

Diseases of the Heart.— In the treatment of organic diseases of the heart, hydrotherapy plays an essential part. Very hot baths, prolonged warm baths, and very cold baths must be carefully avoided. The great success which has attended the effervescent bath treatment of cardiac disease in the hands of the Schott brothers at Nauheim is certainly not altogether due to the chemical ingredients of the water. When investigating this famous Mecca for cardiac patients a year or two ago (1899) for the purpose of studying the methods employed, the writer was fully persuaded that the thermic impression is after all the most important part of the procedure. The temperature of the bath is about 83°, or a little below the neutral zone. The baths given at Nauheim would certainly be somewhat improved by the addition of moderate friction during the bath.

My records show a very considerable number of cases of advanced organic heart disease with distinct evidence of cardiac dilatation, in which very marked relief has been obtained by the simultaneous employment of the carefully graduated tonic bath, the neutral bath, the neutral douche, massage, manual Swedish movements, and a careful diet.

Nervous Diseases. — It is perhaps in nervous diseases that the greatest triumphs of hydrotherapy are achieved. There is certainly no remedy which accomplishes so great results in hysteria, although as this disease is commonly a manifestation of a hereditary predisposition, it is necessary that the patient should be trained to the daily systematic employment of such appropriate measures to be continued at home after an apparent cure has been effected as the result of treatment, so that a recurrence may be prevented.

Insomnia, which so often baffles the practitioner who relies solely upon hypnotics and ordinary therapeutic means, rarely fails to yield with great promptness to the application of appropriate hydriatic measures. The patient who can not sleep because of cerebral congestion goes off to sleep almost immediately when the blood with which the brain is surcharged is diverted into his lower extremities by a hot (not very hot) foot or leg bath (102°–104°) or by a neutral spray (92°–95°), duration five minutes, with considerable pressure, administered just at bedtime. In obstinate cases, the wet-sheet pack is almost certain to secure relief, the patient generally falling asleep in the pack. The moist abdominal bandage is an efficient sleep promoter in most cases of this sort. In cases in which the sleeplessness is due to irritability of the cerebral cells, the neutral bath (92°–95°) affords a remedy of priceless value, rarely failing to secure a good sleep almost from the first application. It is indeed a not uncommon thing for the patient to fall asleep in the bath. Prolonged application of the bath is essential in many cases (30 minutes to 2 hours).

Nervous trembling, or shaking of the hands, usually regarded as a most inveterate condition, has readily yielded to a carefully adjusted hydriatic prescription. The patient had been under the care of leading specialists of the United States, who had pronounced his malady incurable. The movements of the hands were so rapid that only a blur is noticed in a photograph taken at this time instead of a clear image of the hands as seen in another photograph taken after a thorough course of hydriatic treatment.

Migraine yields with a considerable degree of promptness to properly arranged hydriatic measures combined with a suitable dietary and correct habits of living. In a paper by the writer published some years ago, a considerable number of cases of this disease were reported, in which a cure had been effected. Many scores of additional cases have since been recorded. The writer has also been glad to note that the methods suggested in the paper referred to have been adopted by a considerable number of physicians, and with excellent results.

Drug habits, alcoholism, the opium habit, and even the cocaine habit, yield most surprising results to judicious hydriatic management. Within three days, if not in a much less time, the old opium habitué is able to dispense with his drug, and although weak and somewhat nervous, the craving is generally gone, never to return, provided the patient continues the regimen marked out for him. The prolonged neutral bath relieves the extraordinary nervousness and sleeplessness resulting from the withdrawal of the drug. Hot and cold applications to the spine and the cold precordial compress overcome the cardiac depression. The neutral douche, massage, fomentations, the hot-and-cold cephalic compress, and various other measures are employed to meet special indications.

The method of dealing with chronic alcoholism does not differ essentially, except that vigorous tonic measures are more readily borne at the first. The writer has had an opportunity to test this method in some hundreds of cases of this sort, the results of which, together with an outline of the exact method employed, were given in a paper read by request before the American Association for the Study and Cure of Inebriety at its Boston meeting, Dec. 7, 1897.

Myelitis and Locomotor Ataxia. — Even such inveterate maladies as chronic myelitis and locomotor ataxia yield not altogether fruitless results to the hydriatic method. Hydrotherapy combined with carefully directed exercise and a rational regimen rarely fails to secure a very marked degree of improvement in locomotor ataxia. Generally nearly all the lost movements are regained. Very often the ataxic symptoms disappear, and though the knee jerk does not return and the Argyll-Robertson pupil and some other symptoms remain to remind the patient of the grave malady from which he has suffered, yet in quite a large proportion of cases the patient may be brought to

such a degree of recovery as to enable him to engage in his ordinary business pursuits, to enjoy excellent health, and to hold the disease at bay for many years. In a few cases, the patient becomes practically well. The hot half-bath and the heating spinal compress exercise a marvelous controlling influence over the lightning pains. The prolonged neutral bath lessens general nervous irritability, promotes elimination of the toxins which probably lie at the foundation of the disease, and lessens the activity of the morbid process.

Riess showed long ago the excellent results which may be obtained by the prolonged immersion bath in chronic myelitis. The writer has seen excellent results from this method, and also from less severe hydriatic measures. General tonic baths very carefully administered, the heating compress to the spine, galvanism to the spine, and the continuous wet girdle, are measures which afford a very considerable degree of relief in these cases, and sometimes the patient seems to be entirely cured.

Insanity.— For more than twenty-five years, the writer has had opportunity to make a practical application of the hydriatic method in the treatment of cases of insanity in a small institution devoted to this class of patients. In not a few instances cures have been effected in cases which had received no benefit from ordinary routine institutional treatment. It is gratifying to note the interest that is being shown in recent times by the medical directors of State insane asylums in the introduction of hydriatic and other physiological measures in dealing with this increasingly large class of patients. Hydrotherapy certainly affords unrivaled means for reducing the high blood pressure of melancholia, and combating the autointoxication and other nutritive disorders which unquestionably lie at the foundation of this disease. So likewise in mania the blood pressure may be more conveniently raised by hydriatic procedures than by any other method. The indigestion, agitation, insomnia, and numerous functional disturbances presented by mania are not only palliated but substantially relieved by suitable hydriatic measures. The writer has often seen a violent maniacal patient who had not slept for several days, put soundly to sleep within half an hour by the wet-sheet pack or the neutral douche.

The confusional forms of insanity are especially amenable to the hydriatic method, affording a most efficient means for combating the toxic element which plays so prominent a part in this class of cases.

General paresis and other forms of insanity accompanied by organic changes in the brain are, of course, not curable by the hydriatic or any other method, yet many of the morbid conditions presented by these maladies may be successfully combated by suitable hydriatic procedures. This is especially true of the bladder and bowel troubles which present themselves in this affection, and of other conditions akin to those encountered in mania and melancholia.

Fifty years ago, hydrotherapy was an empirical method, but at the present day there is no therapeutic method which rests upon such a sound and complete physiological and rational basis as does this. Rational hydrotherapy represents the oldest and simplest and the most potent therapeutic agency known to the human race. Of its more than two hundred procedures which have been accurately described, and which have proved their utility in clinical experience, many have been in use from the earliest ages known to history. Multitudes of other systems, methods, and medicinal agents and concoctions innumerable have appeared and vanished, and will continue to do so, but hydrotherapy will go on forever, continually achieving new triumphs, occupying broader fields, and standing fast, a veritable therapeutic Gibraltar when other unnatural, artificial, and defective methods have passed into oblivion.

The value of this method is at the present time so well recognized in Continental Europe that every great medical school has attached to it a Chair of Hydrotherapy; and in the polyclinic connected with the medical department of the Royal and Imperial University of Vienna the hydriatic clinic, established by Professor Winternitz, is as popular as any other, and is equaled by none in the success attained in dealing with chronic disorders of all classes. Some eight years ago, the writer opened a hydriatic clinic in Chicago, which has since been conducted under his supervision, and most gratifying results have been obtained in the treatment of several thousand cases annually. Dr. Baruch, of New York, has for many years conducted an eminently

successful hydriatic institute and also a hydriatic clinic, which daily demonstrates the superiority of this method over those which strike less effectively at the pathological roots of disease.

The time has certainly come when scientific medical men can no longer decline to recognize the full importance of the hydriatic method, and must prepare to give their patients the benefit of this therapeutic resource, either at their own hands, or by sending them to institutions in which the hydriatic technique is understood and conscientiously followed by skilled attendants working under experienced and intelligent supervision.

REPORT OF A CASE OF GOUTY ARTHRITIS.

BY RUTH MERRITT, M. D.,
Chicago, Ill.

MRS. B., a somewhat obese English washerwoman, forty-five years of age, came to the dispensary March 12, 1900, complaining of severe pain and lameness in the right knee. She was in very destitute circumstances. Being unable to work, she was endeavoring to support herself and her little daughter by keeping a small general store in a basement, which brought her a few pennies a day.

She gave a history of a fall, Dec. 13, 1899, from which she received some slight bruises on the left leg. In a few days the right knee became very painful and somewhat swollen, so that she was unable to walk more than a few steps. She was treated for traumatic synovitis, but grew gradually worse until she was unable to sleep on account of a throbbing pain, which she described as beginning in the right large toe and extending upward to the knee. She also complained of pain and tenderness along the sciatic nerve.

From a girl she had been subject to occasional sick-headaches. About the time the trouble with the limb began, her headaches grew worse and more frequent. When she came to us, she had them every other day.

Her diet consisted of meat three times a day, tea four or five times a day, with a little bread and potatoes.

On examination, her limb was found to be swollen and tender below the knee. Crepitus was elicited on bending the large toe and knee joints.

A diagnosis of gouty arthritis was made.

Tea, coffee, and meat were proscribed, and a diet of toasted bread and grains, fruit and tomatoes was advised. Baked potatoes, well-cooked beans, and butter were allowed later.

In a few days she returned somewhat discouraged. She had followed the diet prescribed, but her headaches were worse than ever. At this time she was given a thorough enema, fomentations over the stomach, and a warm full bath followed by a hot and cold spray, after which she went home greatly relieved.

From this time she came daily for treatment, which consisted of hot leg packs followed by cold sprays, alternating with hot and cold foot baths, and a full bath followed by a spray or salt glow. Each morning she took a vigorous cold sponge bath at her home.

She had three sick headaches the first month. April 12 she walked six blocks. One week in May she spent house cleaning, but exposure brought on a return of her symptoms, which, however, soon yielded to the treatments, which she had discontinued when she went away to work.

By the middle of June she was able to walk where she pleased, and her headaches had almost entirely disappeared. The treatments were then discontinued.

When seen again in July, she was feeling well, and had no pain or lameness in her limb.

October 21 she reported that after an injury to her limb she had suffered some pain, but only for a short time. She still had occasional headaches, but could always trace their cause to an error in diet or some nervous strain.

No medicine was given. The change in diet, by removing the cause of much of the trouble and furnishing true nourishment to the worn-out cells, gave nature, encouraged by the hydriatic treatments, a chance to rally and rise above the poisons with which she had been struggling so long.

TRANSLATIONS AND ABSTRACTS.

[THE articles in this department are prepared expressly for this journal.]

MEMBRANOUS ENTERITIS.

H. WESTPHALEN (*Berl. klin. Woch.*, 1901, Nos. 14 to 16) has paid great attention to the symptoms of the affection variously termed mucous or membranous or pseudo-membranous enteritis or colitis. Nothnagel separates one form (colica mucusa), in which the passage of membrane-like material is associated with paroxysms of pain, from another form (enteritis membranacea), in which, though the manifestations are on the whole similar, the pains are less marked. In the first type of case the affection must, according to Nothnagel, be regarded as an intestinal neurosis without organic change in the bowel; whereas in the second type the organic changes significant of chronic catarrh are present.

Chronic catarrh, as Leube points out, is not sufficient by itself to explain the formation of the membranes in the bowel, and even when it is present one must suppose that a neurosis of the secretory apparatus of the bowel exists at the same time. In both types of cases the accumulated secretion in empty and contracted portions of the bowel may come to constitute membranous bands.

Rosenheim regards the neurosis as one of secretion and sensation, and Fleischer points out that the severity of the pains associated with the passage of the membranes is unintelligible, unless one supposes that there is some hyperesthesia of the nervous apparatus of the intestinal walls. Other authors regard all cases, whether there be much pain or not, as either symptomatic of enteric catarrh or intestinal neurosis. All authors are agreed that the affection chiefly occurs in nervous, neurasthenic, and hysterical individuals, especially in women suffering with enteroptosis, or disorders of the sexual organs and from chronic constipation, though sometimes the passage of the membranes is associated with diarrhea.

Chevalier and other French authors have drawn attention to an association between membranous enteritis and intestinal sand. Westphalen gives two cases of intestinal sand. One in a boy, aged seven, in whom chronic colitis followed an acute intestinal catarrh, and the passage of the sand was accompanied by much mucus, often blood-stained; the other in a woman, aged thirty-two, in whom the passage of sand was especially noticed when, on account of constipation, she ate more than her usual amount of fruit (grapes). There may be a passage of a formless, slimy material resembling frog's spawn, or there may be more or less folded membranes, or strings, bands, etc., sometimes resembling portions of tapeworm.

A very rare form of the mucous material passed may be compared in shape to hydatidiform moles. Westphalen gives the case of a very hysterical lady, with atonic constipation, who passed large quantities of formless, slimy material without any pain. He also at considerable length refers to a lady, aged about thirty, in whom apparently a certain amount of pyloric stenosis followed a gastric ulcer. Sometimes mere shapeless slime was passed, at other times cord-like membranous material, the latter only when spastic constipation existed. Actual pain was only once noted; then the descending colon could be felt contracted like a cord, a cord-like membrane was passed, and the pains were compared to those of labor. Altogether he gives eight cases illustrating the passage per rectum of amorphous, membrane-like, and cord-like mucous material; in some of these cases pain played a part, in others not: five of the patients were females, three males.

Westphalen concludes that Nothnagel's etiological division into two groups can not be maintained. He thinks that in all cases there is hypersecretion of nervous origin. In uncomplicated cases, amorphous, slimy material is passed per rectum, but when spastic conditions of the bowel are likewise present (generally "spastic constipation"), the slimy material is compressed, and cord-like bodies are found in the motions. When severe pain is present during the passage of the mucous material, a sensory neurosis of the bowel (Rosenheim) may be supposed to be associated with the secretory neurosis.

In practice, a diet rich in cellulose was found to give good results. Noorden, who in 1898 recommended such a diet, considered that exercise of a disordered organ often gave better results than rest-

ing it. The action of the bowels should be aided by oil enemas, etc. The general nutrition of the patients may be improved by increasing the carbohydrates and fats in the diet, while a favorable action on the nervous system can be obtained by exercise, gymnastics, hydrotherapy, etc. Mild treatment by douches is especially useful. Westphalen thinks well of bromides, and occasionally uses opiates and belladonna for temporary purposes.—*British Medical Journal, June 15, 1901.*

AN ANALYSIS OF FIVE THOUSAND CASES OF DEATH FROM MALIGNANT DISEASE.

E. N. NASON, M. D., (*British Medical Journal*, May 18, 1901) gives the following conclusions from the report of the committee appointed to make an investigation as to the influence of locality on the prevalence of malignant disease: —

"1. Certain more or less well defined areas exist in which the mortality from cancer is markedly above, and others in which it is markedly below, the average for England and Wales.

"2. Although age and sex undoubtedly influence this variation, in some cases considerably, they account for only a small proportion of it.

"3. Owing to the great difficulty of diagnosis in many cases of internal cancer, the death-rate from cancer is probably at present underestimated.

"4. Contamination of the soil or subsoil for a long period with decomposing organic matter is probably a factor in the production of a high death-rate from cancer.

"5. A damp, ill-drained, water-clogged soil, of whatever geological formation, is more frequently associated with a high cancer death-rate than is a dry, well-drained soil.

"6. There is abundant evidence of the existence of groups of houses in which cancer is found with marked frequency; and some evidence which tends to show that second and third cases often occur in the same house with greater frequency than can be accounted for by mere coincidence.

"7. Cancer occurs more frequently in old than in new houses and districts.

"8. There is some evidence suggesting that under certain circumstances cancer may possibly be transmitted from one person to another in constant close association.

"Although the evidence collected by the committee does not, of course, disclose the nature of the exciting cause or causes of cancer, it points, I think, very strongly to the existence of some definite exciting cause or causes: —

"1. Prolonged local irritation, due to various causes, setting up local inflammatory changes in the irritated tissue.

"2. The immediate or after-effects of direct and sudden injury, whether mechanical, thermal, or chemical.

"3. Syphilis and possibly other constitutional diseases which are associated with local tissue changes.

"4. The tissue degenerations of advancing years varying with the age.

"5. Individual proclivity.

"6. The presence of fetal remnants or 'cell rests.'

"7. (According to the committee's report) The residence in the neighborhood of a sodden and sewage-soaked soil.

"Now all the predisposing causes, except possibly the last, resolve themselves into conditions in which the resisting power of the individual cells have most probably been reduced. At any rate the vitality of the cells or their power of specialization has been interfered with.

"It is in just such a condition that the invasion of a parasitic organism might be expected to have the most chance of success. And as the existence of some external exciting cause is necessary in order to explain the known facts in the large majority of new growths, one can hardly refrain from suggesting that these various predisposing causes are simply conditions which prepare the soil for the advent and growth of some essential exciting cause, possibly a parasitic organism.

"But if such germ exist, how does it gain entrance into the body? How does it reach the tissue in which by its influence or growth a malignant tumor is subsequently found? This may take place in one or more of the following ways: —

"1. Absorption from the intestinal tract.

"2. Absorption from the respiratory tract.

"3. Direct inoculation (*a*) through abrasion of the skin or mucous membranes, (*b*) by the bites of blood-sucking insects.

"The great frequency with which malignant disease occurs in the various portions of the intestinal tract or on those portions of the surface skin most exposed to injury, would suggest that a definite local inoculation does sometimes take place; and indeed there is strong presumptive evidence of this in many cases. For instance, how often in the case of surface epitheliomata do we get the history of a small neglected abrasion which 'would not heal,' followed by the formation of a definite growth. In connection with this it is interesting to remark that in going through the statistics collected by the committee, it was noticed that in a remarkable number of the cases of surface epitheliomata recorded, the patients were agricultural laborers, just the persons most subject to such conditions.

"Instances of apparent direct inoculation might be multiplied indefinitely by examples taken from the lip, tongue, scrotum, etc., or by the power of an epithelioma (of the vulva, for instance) to start a second growth by direct contact.

"A second mode of direct inoculation which should be considered, is the possible conveyance of the 'essential germ' into the blood or the tissues through the agency of blood-sucking insects, such as gnats, midges, horseflies, mosquitoes, fleas, and bugs. In the light of the established connection between malaria and the mosquito, this should merit serious consideration."—*British Medical Journal.*

Treatment of Paralysis Agitans by Systematic Exercise.—J. M. Taylor (*Journal of Nervous and Mental Diseases*, March, 1901) suggests a plan of treatment intended to counteract the rigidity and impairment of movement. His treatment consists in regulated exercises for the muscles, beginning with massage and passive movements. The muscles least used (those of the neck, hips, and back) showed in one patient, an artist of sedentary life, a tendency to contracture, and felt dense and hard, while the overlying skin was tense and dry. Treatment consisted at first of passive movements and massage of the skin with oil inunction; passive movements of the limbs, back, neck, and jaws were practiced to overcome the tendency to contracture; a special and graduated system of voluntary extensor movements followed; namely, extending the spine after stooping, stretching the arms and legs to the greatest extent, and deep breathing to overcome the rigidity of the chest. Suspension, as in tabes, was a valuable adjuvant to these exercises; the tissues became more elastic, "tinglings and burnings" were felt in these parts as though they "went to sleep," and it was necessary to practice deep massage to overcome the agony thus caused. This was absent when the contracture was slight or absent. A severe frontal headache was usually present during and for a time after the exercise. This, some weeks after, gave place to a pleasurable sensation, and later, the patient experienced a "glow of satisfaction during and after the movements." It is important to continue the exercises daily after improvement is established, the most important movements to overcome the tremor being slow, full, forcible expansions and the attainment of normal attitudes. Full thoracic capacity should be developed by deep-breathing exercises. Several cases are reported in which marked improvement followed this system of treatment. —*American Medicine, June 29, 1901.*

The Effect of Alcohol on the Nervous System, the Mind, and Heredity. —In an article in the *Journal of the American Medical Association*, March 23, Albert E. Sterne closes a very able paper on this subject in the following words: —

"In conclusion let me emphasize by repetition the import of the foregoing. As I frequently tell my students, 'it is not the man who occasionally becomes intoxicated who gets into trouble, but the man who drinks much and never gets drunk, or he who is nearly always drunk, that becomes a candidate for disease.' His are the blood-vessels that early grow less elastic and more brittle; his are the chances for apoplexy and consequent infirmity; his are the weakened will-power and moral force; his are the nerve tissues that show slight vitality. His, again, are the offspring of stunted intellectual mold, who lack the ennobling qualities of men and women, but show to a marked degree the signs of mental, moral, and physical degeneracy, which make them easy victims of epilepsy, imbecility, and idiocy on the one hand, and on the other give them the inherited and acquired right to

a berth in the insane hospitals, the jails, and the penitentiaries.

"If but the true import of the alcohol question were understood, and a proper conception of the effect of alcohol on the physical and mental qualities were gained, I believe few generations would pass before we should find in place of our institutions for restraint and punishment, hospitals for the care and cure of a class of patients more ill often than those whom we generally regard as sick or diseased."— *The Charlotte Medical Journal.*

Reduction of Body Temperature by the Evaporation of Warm Water.— F. R. Williams (*Jour. A. M. A.*, May, 1901) in 1895 called attention to the effective reduction of temperature by the evaporation of warm water from the surface of the body. After a much more extensive experiment he again calls the attention of the medical profession to beneficial results obtained from the use of this simple but effective procedure.

During the administration of the bath, the patient is placed on a rubber cloth or a woolen blanket. The exposed surface of the body is covered with one thickness of coarse gauze. Water at a temperature of 110° to 115° is sprinkled over the gauze, and the water is then evaporated by means of a current of air forced over the body by a fan in the hand or an electric fan. The author finds that the average reduction of temperature is about 2.6° for each bath. [This procedure is much more effective when friction to the surface is employed while the evaporation is going on. The friction prevents contraction of the peripheral vessels, thereby increasing heat radiation from the surface. —C. E. S.]

Vertigo—A Stomach Lesion.— There is no symptom so troublesome as that of vertigo; its etiology is just as perplexing. There are many forms of vertigo, but Martin A. A. Shelberg, writing in the *Medical News* in regard to the mechanism of vertigo and stomach, says he is of the opinion that this symptom is brought about by one or all of three causes; to-wit,—

1. Reflexly through direct irritation of the gastric branches of the pneumogastric, and thence by the lower cervical ganglion to the vasomotor nerves of the vertebral artery, which supplies the internal ear.

2. By toxemia from amulon and other ptomaines, nicotine, alcohol, reabsorption of bile, the toxins of the infectious diseases, etc.

3. By direct pressure upon the heart through distention of the stomach and intestines by gases, resulting principally from so-called amylaceous indigestion and hyperchylis.— *The Charlotte Medical Journal.*

The Pathology of Asthma.— G. N. Jack (*Buffalo Medical Journal*) believes that many asthmatic attacks are due to intestinal indigestion and toxemia with resulting abnormalities of the blood, lymph, and chyle. He divides asthmatic blood conditions into three groups,— asthmatic lymphocytosis, asthma due to an intestinal toxemic leucocytosis, and asthma due to anemia. Under the second heading, he calls attention to the large percentage of eosinophile cells seen during an acute attack. He says that the occurrence of such excessive numbers of these cells in the peripheral blood in a condition like this, in which the mortality of the leucocytes greatly exceeds their nativity, on account of the toxic and ill-nourished condition of the blood, would indicate that the leucocytes have an eosinophilic origin. This hypothesis affords two rational explanations for their excessive numbers in the blood of the asthmatic. First, that they had migrated into the blood to hasten the formation of new leucocytes; and second, that they had been forced to abandon their normal breeding-places in the lymph tissue of the intestinal canal, from its toxic condition. Thus all the pathological constituents found in this variety of asthmatic blood are directly due to the rapid completion of the life cycle of leucocyte, with its consequent pathological representation of all its life-cycle phases, as its origin, existence, death, and remains, which would be respectively represented by the eosinophiles, leucocytes, uric acid, and possibly Charcot-Leyden crystals.— *Medical Record, June 22, 1901.*

Gastric Ulcer.—Sir Lauder Brunton (*Medical Press*, May 1, 1901) states that

in a large number of cases of gastric ulcer the pain can be stopped almost to a certainty by the administration of sodium bicarbonate, provided the drug is given in sufficient dose. The writer's plan is to dissolve a teaspoonful of soda, the patient to sip the solution teaspoonful by teaspoonful until the pain is gone. The best way to dissolve the soda is not to add it to plain water, but to lime-water, flavoring with a little spirit of mint. The reason assigned for using lime-water is that the bicarbonate of sodium in plain water might possibly soften the tissues to too great a degree, and thus predispose to hemorrhage. A case is reported in which this apparently occurred. To lessen the constipation caused by the lime, fluid magnesia may be given with the bicarbonate of sodium. An alternative formula o the above is:—

	Drams
Spirit of peppermint	1½
Prepared chalk	½
Light magnesia carbonate	1
Sodium bicarbonate	1

A teaspoonful of this preparation should be stirred in half a tumbler or more of water, and slowly sipped, a teaspoonful at a time, until the pain is relieved.— *American Medicine, June 29, 1901.*

The Semeiological Value of the Examination of the Blood in Cancer of the Stomach.— Hartmann and Silhol (*Rev. de Chir.*, No. 2, 1901) have recently communicated to the Société de Chirurgie de Paris the results of some researches made on the blood of surgical patients. In the course of these researches they have been convinced that in cases of cancer of the stomach, an examination of the blood is more likely to prove useful than a chemical investigation of the gastric contents. The authors in their studies, made a particular investigation on two questions: (1) The degree of anemia characterized by diminution of the quantity of hemoglobin, which may depend on the reduction of the number of globules or on the reduced proportion of hemoglobin in their contents; and (2) the existence of leucocytosis. The presence of cancer of the stomach, it is held, is indicated by a well-marked association of decided anemia with decided leucocytosis. Anemia is marked less by (1) a diminished proportion of the hemoglobin in the globules; (2) than by irregularities in the form of the globules, indicating a profound modification of the elasticity and texture of the red globules; and (3) by inequality in the size of those globules that are not misshapen. The leucocytosis, to have any value as a symptomatic sign, should be very marked, and should affect especially the mono-nucleated cells.— *British Medical Journal, March 23, 1901.*

Spices as a Cause of Cirrhosis of the Liver.— Dr. Tinozzi, an Italian physician (*Med. Press and Circular*), has demonstrated by actual experiment that the use of spices and condiments will of itself determine cirrhosis of the liver, a condition usually associated with the abuse of spirituous beverages. He administered ordinary pepper and cayenne pepper, either alone or together, to dogs and rabbits for long periods of time, extending in some instances to upwards of twelve months. In the dog, the ingestion of even comparatively large doses of these substances did not prevent a gain in weight; but when the dogs were killed, the liver cells were found to have undergone necrosis similar to that produced by phosphorus. In the rabbit, he invariably observed a tendency to emaciation accompanied by cirrhosis of the liver. It is inferred from these experiments that pepper exerts an irritating and degenerating action on the liver substance, and a sclerosing effect on the liver stroma identical with that brought about by alcohol and certain other poisons.— *Cincinnati Lancet Clinic, March 30, 1901.*

The Effect of Tight Lacing upon the Heart.— Professor Schott (*Med. Press and Circular*) has observed in a number of recent investigations that tight lacing has a deleterious effect upon the heart. He observed that by constricting the abdomen with a belt, dilatation of the heart under exercise was further increased by reason of the addition to the amount of blood flowing into the right ventricle, especially increasing the amount of work to be done by the heart.

Experiments upon animals carried on by Roy, Adami, Fry, and Krehl confirm the observations made by Schott. These investigators have shown that compression of the abdominal veins causes dilatation

of the heart by increasing the total output, that is, the work done.

In the case of dancing combined with tight lacing, the conclusion has been reached that persistent dilatation of the heart following continued muscular exertion may be regarded as of a pathological character, and expressive of overstrain of the heart.

Pathogenesis and Treatment of Rickets. — E. Pritchard (*Arch. of Pediatrics*) reaches the following conclusions concerning the nature of rickets: —

1. The symptoms of rickets are such as can be explained by the presence of an excess of lactic and similar acids in the system.

2. Excess of lactic acid can be generated when the food supply (carbohydratic chiefly) is relatively excessive, or the available oxygen is relatively deficient.

3. Infants fed on excessive diets can develop symptoms of rickets, although no element necessary for metabolism is absent from the food.

4. Such cases can be cured by reducing the food to normal proportions without in any other way altering the treatment.

5. The cause of rickets in these cases, and probably in all cases, is excess of some element, and that element is probably carbohydrate. — *The Medical Standard.*

Formalin in Metrorrhagia. — Gerstenberg (*Cent. fur. Gyn.*, No. 34) discusses the value of intrauterine applications of formol, as advocated by Menge, and reports eleven cases in which good results were obtained. The undiluted formalin (40 per cent formaldehyde solution) is applied to the interior of the uterus with a Playfair applicator, which is rapidly withdrawn after touching every portion of the uterine mucous membrane. The disinfected vagina is filled with cotton tampons, which are removed after twenty-four hours. Gerstenberg uses this treatment in his office, but insists that the patients, after reaching home, remain in bed for at least two days. The cases treated, comprised climacteric bleeding, menorrhagia, endometritis, subinvolution *post partum*, etc. The results were always favorable, and subsequent stenosis was never observed. — *The Am. Jour. of Obs.*

Phototherapy, Physiopathological and Clinical Studies of the Electric Light Baths.—Ch. Colombo (*Revue Internationale de Thérapie Physique*, May 1, 1901) describes one of the first effects of this light bath to be augmentation of the number of pulsations and respirations. They are both fuller and the respirations are more profound. After the bath, besides the copious perspiration, an erythematous condition of the skin has been noted, which begins immediately after the lamps begin to burn. Loss of flesh has occurred in all the cases of obesity, especially after prolonged treatment. Very advantageous results have been obtained in certain articular affections, such as inflammatory and traumatic anchylosis. Gymnastic exercises and massage are rendered more efficacious by being combined with this treatment. Remarkable results have been obtained in all forms of the vague neuralgias from which patients with the uric diathesis suffer. In certain forms of anemia and of neurasthenia the results have been very satisfactory. Flesh has increased, as well as muscular force and strength of digestion. The writer believes that this treatment is destined to play a grand part in therapeutics. It is superior to every other therapeutic agent employed as a diaphoretic, for the great rapidity with which it provokes profuse perspiration— three to ten minutes. Its great advantage is the very stimulating action which it has on all the functions of the organism. This is not caused by the temperature, but by the chemical power of the ultraviolet rays given off by the electric lamps. —*Medical Record, July 20, 1901.*

How to Avoid Prickly Heat.— Major R. R. H. Moore (*Journal of Tropical Medicine*) considers the disease to be caused by irritation of the skin produced by a constant bath of perspiration. The remedy is to preserve nature's protective coat by abandoning the use of soap, and after the bath anointing the body with pure cocoanut oil. It should be put on with the hand, not with a sponge or rag. The skin absorbs the oil, and the body can be rubbed with a towel without any of it coming off, unless an excess has been used, when the towel will remove the excess. — *Medical Record, June 8, 1901.*

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

THE TOXIN OF THE COLON BACILLUS.

SINCE the colon bacillus is practically always present in milk, the observations of Victor C. Vaughan (*American Medicine*, May 18, 1901, p. 302) are of interest in reference to the bacterial condition of the city milk.

Vaughan worked with colon bacilli derived from cheese, water, and normal feces. The virulence of the organisms was first increased by passage through several animals. Beef-tea cultures were inoculated on beef-tea agar in large Roux flasks. After a sufficiently thick growth had occurred, the bacteria were scraped from the surface of the medium, and experiments were made on the separation of the toxin. A summary of the facts obtained is as follows: —

1. The toxin is contained within the germ cell, and does not, under ordinary conditions, diffuse into the medium. Beef tea in which colon bacilli have been grown, does not, after filtration, kill guinea-pigs, while the unfiltered medium is fatal.

2. The toxin is not extracted from the cell by alcohol or ether.

3. Very dilute alkalies do not extract the toxin. After boiling a quantity of the germ substance for five minutes in 0.25 per cent potassium hydrate, and then centrifugating, the clear supernatant fluid was found inert, while the material thrown out was highly toxic.

4. The germ substance may be heated to a high temperature (184° for thirty minutes) without destroying its toxin, though the cell wall is broken. Watery emulsions, after this heating, were separated by centrifugation, when both the clear fluid and the precipitate were found fatal to guinea-pigs.

5. Boiling with a 0.2 per cent solution of hydrochloric acid has little or no effect on the germ or its toxin.

6. Heating for an hour in the water bath with one to five per cent hydrochloric acid, breaks up the cell wall, and lessens but does not destroy the toxicity. Prolonged heating may render the toxin inert.

7. The toxin, as separated from the cell wall by digestion with pepsin and hydrochloric acid, is markedly active.

By extracting a quantity of germ growth with alcohol, digesting four days with pepsin and HCl in the incubator, filtering, washing with alcohol, and then drying, a powder was obtained, which was found to be soluble in water which contained enough bicarbonate of soda to render it slightly alkaline. This opalescent fluid, after being boiled, was highly toxic, one fifth of a milligram being sufficient to kill a guinea-pig of 200 grams' weight. The peritoneal cavity of guinea-pigs killed by this toxin usually contained from 2 to 10 c.c. of serous exudate. This exudate was always sterile. It had no destructive effect on the colon bacillus, and produced no agglutination. On the contrary, the germ grew freely in this exudate. Vaughan says, "The fact that at least one of the bacterial toxins is a remarkably stable body, and can be obtained in the dry state and permanent form, justifies us in taking a somewhat more optimistic view concerning the probability of ascertaining the chemical constitution of these bodies than that recently expressed by Brieger and accepted by Ehrlich."— *Maryland Medical Journal, June, 1901.*

Rapid Cultivation and Differential Stain for Diphtheria Bacillus.— A. L. Goodman, in the *Medical Record* of Feb. 16, 1901, says that the modification of Neisser's stain, published by Concetti, is an improvement over other methods. The method is as follows: —

A sterilized glass or iron rod has twisted upon its end a small piece of absorbent cotton, impregnated with glucose glycerinated agar-agar. The rods are kept in sterilized test-tubes. When a culture is to be made, a rod is removed, the affected part swabbed with the end containing the culture medium, and the rod at once replaced in the tube. It is then placed in an incubator, and kept at a temperature of 36° to 37° C. In four or five hours' time there will have been sufficient growth to make a smear. The latter is stained with a mythylene blue solution consisting of mythylene blue, 1 gram; alcohol, 20 cubic centimeters; distilled water, 450

grams; acetic acid, 5 grams. This solution should remain on the slide not more than two or three seconds. The spread is then washed with water, after which it has an intense blue color. A counter-stain is employed consisting of two grams of vesuvin in 1,000 grams of water. This solution is heated, and filtered while still warm. The specimen should be exposed to the action of the vesuvin from fifteen to twenty seconds, and then washed in water. It displaces the methylene blue. If no Loeffler bacilli are present, the gross appearance of the smear is brown. The presence of the true or the pseudo-bacill- gives a mixed blue and brown color. Under the microscope the pseudo-bacilli are stained brown in their entirety. The true bacilli have a brown stain, but the ends of the bacilli present the characteristic blue points, which is the chief differential test.

Hygiene and Bacteriology —Investigations in Rheumatic Fever. — A. Paine, London (*Lancet*, May 4, 1901), has continued his investigations upon rheumatic fever, and states that he has demonstrated the diplococcus in three rheumatic nodules taken from two cases of rheumatic fever. He has isolated the diplococcus from the nodule in one instance in pure culture. Intravenous injection of this culture has produced valvulitis pericarditis and polyarthritis in a rabbit. He has isolated the diplococcus from the joint exudate of this rabbit, and the nodule is looked upon as a highly characteristic manifestation of rheumatic fever, and therefore this diplococcus is most probably the cause of rheumatic fever. A case is recorded of choreoid movement, following the inoculation of a rabbit, in which the diplococci were found in the piamater and the endothelial cells of the blood capillaries dipping into the motor cortex from the surface. The diplococci undoubtedly circulate in the blood stream, and have been found in the polymorphonuclear leucocytes. — *St. Louis Medical Review.*

The Toxin of the Colon Bacillus. — V. C. Vaughan, Ann Arbor (*American Medicine*, May 18, 1901), has shown previously that the colon bacillus is present in practically all samples of American green cheese, and that cultures of this germ may be boiled without destroying its toxicity. Recently he has experimented further with growths in Roux flasks, and arrives at the following conclusions: The toxin is contained within the germ cell, from which it does not, at least under ordinary conditions, diffuse into the germ medium. The toxin is not extracted from the cell by either alcohol or ether, nor by dilute alkalies. The germ substance may be heated to a high temperature with water, without destruction of the toxin. Boiling with two-tenths per cent HCl has but little if any effect upon either cell or toxin. The toxin as separated from the cell-wall by digestion with HCl and pepsin is markedly active. — *St. Louis Medical Review, June, 1901.*

The Bacteriology of Sporadic Cerebro-spinal Meningitis. — W. Hunter (*Lancet*, June 9, 1901) states as follows: (1) That in all the cases of meningitis examined by him a diplococcus has been isolated from the cerebro-spinal fluid. In nine of these the fluid was obtained by lumbar puncture during life. (2) That this diplococcus has the same morphological and biological characteristics as Weichselbaum's diplococcus intracellularis meningitis. (3) That in some cases the diplococcus was present in pure culture, in others associated with other micro-organisms; *e. g.*, bacillus influenzæ and bacillus tuberculosis. (4) That the clinical picture and the pathological changes found in these cases are those met with in so-called "posterior basal meningitis." (5) That in all probability "posterior basal meningitis" is simply a sporadic manifestation of cerebro-spinal-meningitis, and is produced by the same micro-organism, namely, the diplococcus intracellularis meningitis. — *Medical Record, June 15, 1901.*

Typhoid Bacilli from the Roseola. — E. Fraenkel, of Hamburg (*Zeitsch. Hygiene u. Infectiose Krankheiten*, Bd. xxxiv, Heft. 3), obtained cultures of typhoid bacilli by excising the skin containing the roseola spots, and placing them in bouillon. He believes the roseola represents inflammatory spots caused by typhoid bacilli which are hidden in the lymph spaces. — *Medical Age.*

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WHY PULMONARY TUBERCULOSIS BEGINS IN THE APICES OF THE LUNGS.

DRS. COLBECK AND PRITCHARD, in an interesting paper in the *Lancet* for June 8, 1901, give the first explanation of this fact, which has long been well known to clinicians. They find the cause to be an alteration in the shape of the chest in conjunction with displacement and deficient muscular development of the shoulder girdle. As the result of these changes, "the movements of the apices become inverted in their relation to the normal respiratory rhythm." These observations greatly emphasize the importance of developing the muscles of the upper part of the chest, and also of cultivating correct positions in sitting.

Physicians might render an exceedingly valuable service to the race by calling the attention of school-teachers to this important fact. Children and youth should be given special opportunities for development of the muscles of the upper chest; the development of the pectoral muscles is especially important. Dumb-bell and club exercises by boys and girls and overhead exercises for boys, in which the weight of the body is sustained by the arms, are most useful for this purpose. Ball-playing, tennis, and especially rowing and swimming, are exercises the value of which can not be overestimated as a means of antagonizing the consumptive constitution, an increasing type among Americans. Swimming is by all odds the best of all forms of exercise for the development of the chest, on account of the position necessarily assumed by the body while in the water: the head is thrown back, the chest is well raised forward, while the arms execute movements which develop a full chest and an erect carriage.

Boys and girls should be continually admonished to "stand tall," and to carry the chest forward, rather than to put the shoulders back. It is astonishing how many people go about carrying the chest behind instead of in front, where it belongs. In a correct carriage of the body, the hips are held back, while the chest is carried well to the front, and the chin drawn slightly in. An exaggeration of this position is a stiff and awkward carriage, but when assumed easily and gracefully, it gives to an individual a strong and dignified bearing.

THE HOT EVAPORATING SHEET AS A MEANS OF LOWERING TEMPERATURE IN FEVER.

THIS procedure consists in wrapping the patient with a sheet wrung out of hot water, and then allowing evaporation to take place, either spontaneously or by the aid of fanning; an electric fan is very useful for the purpose. If desired, the sheet may be sprinkled with very hot water every five to ten minutes. The effect of this short hot application is to diminish heat production, while the cooling by evaporation, which should follow quickly after, is a powerful means of heat abstraction.

The evaporation of one pound of water will absorb about one thousand heat units, which for a patient weighing 160 pounds, would amount to a lowering of the body temperature six degrees. Such an effect is never produced, however, for the reason that heat production is constantly going on, and is replacing the heat loss at the rate of 7.2 units or more per minute. With a febrile temperature of 103°, spontaneous evaporation takes place

at a very rapid rate from the surface of the sheets wrapped about the body; and when the evaporation is aided by means of vigorous fanning, as with a current of air from an electric fan, most powerful refrigerator effects are produced. The patient should be gently rubbed continuously.

The application should be renewed every three to five minutes. Care should be taken to rub the patient every few minutes, so as to maintain cutaneous circulation. This measure is especially valuable in adynamic cases, — cases in which the patient is very nervous, depressed, apprehensive, and rebellious about the use of cold water. In one case, the author succeeded in lowering the temperature two degrees in one hour, as the result of renewed applications of the hot sheet.

The hot evaporating sheet should be wrung very dry out of very hot water; the attendant should wrap the sheet about the patient very quickly, so that a strong impression of heat may be made upon the skin. As the evaporation takes place, the sheet will be rapidly cooled, and heat should thus be removed from the body.

The first impression of the hot sheet lessens heat production by reflex influence, and dilates the surface vessels. While the vessels remain dilated, heat elimination takes place at ten times the ordinary rate (Conrad Klar). At the end of three to five minutes, the vessels become contracted so as greatly to lessen the rate of heat elimination, and hence the application should be renewed at short intervals (1 to 3 minutes).

Evaporation is on the whole not a desirable or valuable mode of refrigeration except in cases in which there is very excessive activity of the surface circulation, with abnormal heat and no tendency to chill. Slow cooling of the skin by evaporation causes a contraction of the surface vessels which is not followed by reaction, and which is accordingly not only accompanied but followed by congestion of internal parts. Therefore this method of cooling is rarely indicated.

THE HOT ENEMA IN NEPHRITIS.

In a recent number of the *Medical News*, Dr. C. G. Kerley recommends flushing the colon with a hot normal salt solution as the best means of combating scarlatinal nephritis. Dr. Kerley uses, for a child of three years, from a pint to a pint and a half of normal salt solution at 160°. The solution is introduced as high up in the rectum as possible, and is repeated every six or eight hours. His observation is that after three to five flushings the kidneys resume their activity, as indicated by the free flow of urine.

The writer is glad to add his personal testimony to the value of the hot enema in these cases, having employed this method during the last twenty years, not only in scarlatina nephritis, but in all cases of urinary suppression. The injection of hot water into the colon has the effect to raise the blood pressure, and so relieve the vascular spasm which closes the urinal outlet.

The writer's methods of employing the hot enema differ somewhat from Dr. Kerley's. It has been found advantageous to employ the enema as often as once in two or three hours. As large a quantity is used as the colon will hold. It is not necessary that a special effort should be made to secure the retention of the fluid; a considerable quantity of water will naturally be left behind. Neither is the addition of salt essential. As a matter of fact, pure water is absorbed more rapidly than salt water, in accordance with the well-known law of osmosis.

In a case of acute nephritis, recently observed, the patient, a boy of ten years, had been lying in an unconscious state for more than twenty-four hours, and violent

attacks of uremic convulsions were occurring every two or three hours. The employment of the hot enema, combined with the hot-blanket pack, and an ice-bag over the heart, maintained profuse perspiration, and in the course of a few hours restored uremic activity, and saved the child's life. The same results have been secured in a number of cases of children, and in a very considerable number of cases of acute nephritis in adults.

The maintenance of cutaneous activity is equally important with the hot enema. The skin is capable of holding from one half to two thirds of all the blood in the body. By withdrawing a large amount of blood into the skin, the congestion of the kidneys is relieved, and the heating process is facilitated.

The cardiac depression which naturally exists in these cases is increased by the prolonged application of heat, either externally or internally, or both combined. To combat this, it is important to protect the heart by means of an ice-bag or an ice-compress applied to the pericardial regions. It is well to apply a second over the lower third of the sternum, or to make the compress sufficiently large not only to cover the heart but the lower portion of the sternum.

As pointed out by Beni-Barde, of Paris, many years ago, the skin covering the lower third of the sternum is reflexly related to the kidney; and by the application of cold to this region, the vessels of the kidney, especially the cortex, as suggested by Bottey, may be contracted, and the congestion thus relieved.

The hydriatic method is unquestionably the most important of all means at the command of the physician for dealing with acute nephritis in both old and young, and from whatever cause.

Prof. Remsen Honored.— PROF. IRA REMSEN, head of the department of chemistry in the Johns Hopkins University, was elected President of the University June 3.

IMPETIGO CONTAGIOSA.

THIS contagious form of skin disease is coming to constitute quite a large proportion of the cases with which the dispensary physician has to deal. Statistics show that cases of this sort form about ten per cent of the entire number of all skin affections applying for relief at city dispensaries. The disease prevails especially among the poor in tenement houses and orphan asylums.

The following is the most effective treatment: Remove the crusts by thorough cleansing with warm soap and water. Then apply either one of the following lotions:—

℞ Hydrargyri bichloridid ..... gr. i
Glycerini ..... f℥i
Spts. vini recti ..... f℥i
Aquæ ..... q. s., a. d. f℥iv

℞ Resorcini ..... gr. xl
Acidi borici ..... gr. xl
Glycerini ..... f℥i
Alcoholis ..... f℥s.s.
Aquæ ..... q. s., a. d. f℥iv

The lotion should be applied as hot as the patient can bear without discomfort, warming it by placing in a bottle in a vessel of hot water for a few moments. The application should be made by means of little balls of softened cotton, saturated and held on the parts. The cotton should be held in contact with the diseased surfaces for at least ten minutes. After the parts have dried, either one of the followlowing ointments may be applied:—

℞ Hydrargyri ammoniati ..... gr. x–xv
Pulv. amyli, Pulv. zinci oxidi ..... āā ℥ii
Petrolati ..... ℥ss

℞ Resorcini ..... gr. xv
Lanolini, Petrolati ..... āā ℥ss

The application of the lotion should be made twice daily. The ointment should be removed by washing with soap and water before the application of the lotion. A few applications will usually suffice to make a cure.

A still more effective remedy is nitrate of silver. After cleansing with soap, the parts should be rinsed with clean water, and the diseased surfaces should be touched with a freshly prepared solution of nitrate of silver, having a strength of 10–20 grains to the ounce. The only objection to this method is that it stings the skin, but this objection applies only to parts which are exposed to view.

When the disease affects the scalp or the bearded portion of the face in men, the hair should be kept closely clipped during the treatment.

Hydriatic Treatment of Gonorrhea.— Many of the sequelæ of gonorrhea have been directly traced to the use of harsh remedies in treatment, such as a very strong solution of nitrate of silver, and other irritating drugs. The irritating effects resulting from highly diluted solutions of mercuric bichlorid, and other metallic salts, are often surprisingly great. It is a fact worth knowing, that all these irritants may be dispensed with. Most satisfactory results may be obtained by the irrigation of the urethra with a simple one-per-cent solution of common salt. The solution should be boiled for twenty minutes, then cooled to the proper temperature. Injection should be begun at a temperature of about 100°, the temperature being gradually increased to 120°, or as hot as can be borne. Care should be taken not to increase the temperature too rapidly. If possible, raise the temperature to about 120° or even 130°. The high temperature is, of course, not intended to be sufficient to destroy the micro-organisms, but to cleanse the tissues, and at the same time to increase the vital resistance, so that the tissues are able to destroy the micrococci.

The Exclusion of Consumptive Immigrants.— It is announced that, by a recent decision of the United States Bureau of Immigration, consumptive immigrants are hereafter to be returned to their native land. No statement has ever been made as to whether this rule is to be applied only to all foreigners suffering from tuberculosis, or only to those who arrive by steerage, or second or third cabin. If first cabin, or first or second cabin, passengers are to be exempted from the application of the rule, the query will naturally arise, Why should such an exemption be made? Why should not the consumptive who has a light pocketbook have a chance for his life, as well as the rich consumptive?

If no consumptive is allowed to visit this country for climatic change, should we not expect the rule to be made for other countries? A partial rule seems very inconsistent, so long as little effort is made to suppress the extension of this disease in our country. Unquestionably the time will come when persons suffering from this disease will be placed under such conditions as will prevent the extension of the malady to others. Pulmonary tuberculosis is a disease which ought to be stamped out. It may be more easily controlled than smallpox, the plague, and most other infectious maladies, and it is a disgrace to our boasted civilization that more strenuous efforts are not being made to combat a disease which is responsible for one fourth of all the deaths which occur in civilized communities.

An Improvement in Eye Surgery. — Dr. H. W. Wootton has recently called attention to a method of treating squint, as advocated by Landolt, which is the opposite of the method commonly employed. Instead of cutting the contractor muscle, Landolt's method consisted in advancing the opposite muscle. By this method, the power of the eye is increased. The power of convergence is increased instead of being diminished, and the danger of undesirable results is, to a large extent, eliminated.

REVIEWS.

THE INTERNATIONAL MEDICAL ANNUAL: A YEAR-BOOK OF TREATMENT AND PRACTITIONER'S INDEX, 1901. Nineteenth year. New York: E. B. Treat & Co., 241–243 West 23d St. Chicago: 129 Clark Street. Price, $3.

This, the nineteenth issue of the Medical Annual, is replete with latest scientific advancements in medicine and surgery. A glance at the list of contributors assures one that the work is of more than ordinary worth. Among the new contributors is Professor Ruata, of the University of Perugia, Italy, who has contributed an article on the subject of Tuberculosis, which is of practical value.

The work is one which meets the needs of the busy practitioner, in that it gives the latest advancements in medical lines in a brief and comprehensive manner.

NEW POINTS IN THE ANATOMY, HISTOLOGY AND PATHOLOGY OF THE RECTUM AND COLON. — By J. Rawson Pennington, M. D., Professor of Rectal Diseases, Chicago Polyclinic, Chicago.

A careful perusal of the reprint shows that the author has given a great deal of attention to the subject of which it treats, and has spent much time in original research. The pamphlet is well illustrated with half-tones, which clearly show many points to which the author has called special attention. We quote the following paragraphs from the pamphlet: —

"From experimental studies made upon the living and the dead, it would seem that the function of these plicæ is (1) to prevent the feces from crowding down upon the anus when the bowel is in a passive state; (2) to equalize the pressure of feces that may accumulate in the rectum from time to time; and (3) to facilitate defecation by giving a spiral motion to the fecal mass.

"In support of this assumption I submit the following observations: —

"1. Man is the only animal, so far as I have been able to ascertain, possessing these structures, and in him they seem to be universally present, and he is the only one that defecates at regular intervals.

"2. They are the most prominent when the bowel is distended, and occlude quite one half the lumen of the rectum.

"3. Irritants and foreign bodies cause them to become erect, and present or offer a kind of ledge across the bowel.

"4. Their direction, as shown by numerous casts, specimens, and photographs, is slightly upward, forming, in some instances, distinct cups or pockets.

"5. The congenital hyperplasia of the mucosa, muscularis mucosa, submucosa, and muscular tunics at their apices or along the free margin of the plica.

"6. The binding together of the pillars by white fibrous and yellow elastic tissue.

"7. The observations of Gally, that distention of the bowel with water did not efface the valves, as claimed by Sappey and Testut, but augmented the depth of the chambers bound by these structures.

"All anatomists and physicians admitting the existence of these structures, agree that they interfere with the introduction of instruments. Since this is true, notwithstanding their convex surface is on the distal side, is it not reasonable, therefore, to conjecture that they will offer a much greater resistance to the feces, as their concave surface is on the proximal side? If we have succeeded in establishing our first premise, shall we not attempt to establish another; viz., that these plicæ may, when hypertrophied or in a pathologic state, obstruct or interfere with normal defecation? If they do, what would be the rational treatment of such a condition? Is it necessary for me to ask that question of any physician? I think not. But do these structures become pathologic? Ziegler, in speaking of the new formation of tissue leading to hypertrophy of an organ, says: 'We often have to do with a connective tissue hypertrophy in which the specific tissue elements, especially the glands, do not participate, or may even become atrophied.' 'This condition,' he continues, 'holds particularly good in those tissue proliferations which are the result of the prolonged influence of mechanical and infectious agencies, and are ordinarily described and treated as chronic inflammations.' Now, it seems to me that if the function above ascribed to these valves is correct, herein lies a condition favoring the development of hyperplasia, or chronic interstitial tissue, in these plicæ as a result of prolonged mechanical and infectious irritation.

"In the mucosa there is an increase of connective tissue. This surrounds the glands, contracts upon them, and perverts their secretion, with resulting dry and hard stools and difficult defecation, finally causing atrophy of the glands.

"In the submucosa it not only surrounds the large vascular trunks, nerves, and lymphatics, and contracts upon them and mars their function, but causes loss of pliability in the submucosa, which impairs the free movement of the mucosa over the muscular tunic. It also causes a loss of flexibility in the muscular tunics and muscular insufficiency, and as a result of these and other pathologic conditions the valves are changed from a physiologic intermittent obstruction to a pathologic and continuous one. These pathologic conditions seem sooner or later to become a factor in obstinate con

stipation or obstipation, and its results. The intestinal wall is frequently pouched and thinned immediately above the base of the valve, and hypertrophied opposite the valves' free border. The lumen of the bowel may also be constricted by the contraction of the hyperplastic tissue developed in the valve.

"In closing, permit me to say that I do not wish to be understood or quoted as claiming that all cases of constipation or obstipation are due to causes connected with these valves, for I do not. There are many factors entering into the causation of this trouble. But I believe, from observations made, that in some instances they are an important factor, and should be dealt with accordingly."

PULMONARY CONSUMPTION, PNEUMONIA, AND ALLIED DISEASES OF THE LUNGS: THEIR ETIOLOGY, PATHOLOGY, AND TREATMENT, WITH A CHAPTER ON PHYSICAL DIAGNOSIS. — Thomas J. Mays, A. M., M. D., Professor of Diseases of the Chest in the Philadelphia Polyclinic; Visiting Physician to Rush Hospital for Consumption. Illustrated. New York: E. B. Treat & Co., 241-243 West 23d St., 1901.

The author, from his extended experience in the observation and treatment of consumption, presents in this work some ideas which are quite different from those generally taught with reference to consumption. He formulates the fundamental concepts of the work into the following propositions: —

"1. The pulmonary phthisis in the large majority of cases is primarily a neurosis, and that the pulmonary disintegration is secondary.

"2. That any agent, influence, or condition which undermines the integrity of the nervous system will engender pulmonary phthisis or some other forms of pulmonary disorder.

"3. That the only remedies of value in the treatment of pulmonary phthisis are those which appeal to, and act through, the nervous system.

"4. That of special value in the treatment of phthisis is the counter-irritant action of silver nitrate introduced hypodermically over the vagi in the neck.

"5. That acute pneumonia and other forms of acute pulmonary disease, are closely affiliated with disorder of the nervous system."

THE ACUTE CONTAGIOUS DISEASES OF CHILDHOOD. — By Marcus P. Hatfield, A. M., M. D., Professor Emeritus of Diseases of Children, University Medical School; Professor of Diseases of Children, Northwestern University Medical School; Professor of Diseases of Children, Chicago Clinical School; Attending Physician Wesley Hospital. G. P. Engelhard & Co., 358–362 Dearborn Street, Chicago, 1901; 142 pages; price, $1 net.

This handsome little volume will find a welcome place in the hands of those who do not have the time at their disposal to read the more exhaustive treatises on the subjects of which this book treats. It gives in a clear and pleasing style the more important and recent views on scarlatina, measles, rothlen, mumps, whooping-cough, chicken-pox, smallpox, and grip.

A SYLLABUS OF REMEDIES AND THERAPEUTIC MEASURES; WITH CHEMISTRY, PHYSICAL APPEARANCE AND THERAPEUTIC APPLICATION. By J. W. Wainwright, M. D., Member of the American, Medical Association; New York State Medical Association, United States Pharmacopeial Convention, 1900; American Chemical Society, etc. Pages, 299. Price, $1.00 net. G. P. Engelhard & Co., 358–372 Dearborn St., Chicago, 1901.

ASEPTIC MINOR GYNECOLOGY WITH DEMONSTRATIONS. — By Augustin H. Goelet, M. D., Professor of Gynecology in New York School of Clinical Medicine; Consulting Professor of Gynecological Electro-Therapeutics, International Correspondence Schools, Scranton, Pa., etc. Reprinted from the *Journal of the American Medical Association*, Oct. 6, 1900.

The Battle Creek Sanitarium

LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
NEWTON EVANS, M. D., Pathologist.
ELMER L. EGGLESTON, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR JULY.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	80	91	28	96.5	96	79	204	85.7
Less than 10,000 bac.	2	2	0	0	0	0	2	.8
Between 10,000 and 100,000 bac.	3	3.5			3	2.5	6	2.6
More than 100,000 bac.	3	3.5	1	3.5	22	18.5	26	10.9
Total	88	100	29	100	121	100	238	100

Patients received from the following States: Missouri, 9; Indiana, 25; Michigan, 38; Illinois, 29; Alabama, 4; Kentucky, 13; Minnesota, 7; Vermont, 1; Wisconsin, 9; Pennsylvania, 11; Ohio, 22; Texas, 6; Iowa, 7; Georgia, 1; Virginia, 5; Arkansas, 1; New York, 8; Tennessee, 4; Montana, 1; Colorado, 2; Maryland, 1; Louisiana, 4; Ireland, 1; Jamaica, 1; Mississippi, 4; Connecticut, 1; Ontario, 3; Oklahoma, 2; Kansas, 2; Arizona, 1; California, 1; Canada, 2; District of Columbia, 2; South Carolina, 2; North Dakota, 1; Florida, 1; South Dakota, 2; Washington, 1; Nebraska, 1. Total number, 238.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
100 per cent and over	118	48	166
90–100 " "	93	86	179
80– 90 " "	25	38	63
70– 80 " "	5	11	16
50– 70 " "	4	4	8
Below 50 per cent	6	1	7
Total	251	188	439

Red Count.	Men.	Women.	Total
5,000,000 and over per cu. mm	118	47	165
4,500,000 and 5,000,000	76	71	147
4,000,000 " 4,500,000	23	48	73
3,500,000 " 4,000,000	10	18	21
3,000,000 " 3,500,000	4	4	8
2,500,000 " 3,000,000	7	0	8
Below 2,500,000	13	0	17
Total	251	188	439

Urinary Laboratory.—Total number of specimens examined, 949; number of new cases, 391; number of albumin cases, 29; number of sugar cases, 18; number of casts cases, 8; number of pus cases, 35; number of blood cases, 1.

PUBLISHERS' DEPARTMENT.

THE next annual meeting of the Mississippi Valley Medical Association, under the presidency of Dr. A. H. Cordier, of Kansas City, bids fair to eclipse all previous ones in attendance as well as scientific merit, as the following preliminary program will show:—

1. Address in Medicine, by Frank Billings, Chicago.
2. Address in Surgery, by Reginal Sayre, New York City.
3. Address of President, A. H. Cordier, Kansas City, Mo.
4. Pathological Cause of the Eruption in the Exanthemata, by J. M. Postle, Hinckley, Ill.
5. Acute Intestinal Autoinfection, by John M. Batten, Downingstown, Pa.
6. Surgery of the Palate, with Stereopticon Exhibit, by Truman W. Brophy, Chicago, Ill.
7. Some New Remedial Agents in the Treatment of Gynecologic Affections, by Chauncey D. Palmer, Avondale, Cincinnati, Ohio.
8. Hematology, by L. H. Warner, New York.
9. Surgical Treatment of Pulmonary Abscess, by D. N. Eisendrath, Chicago, Ill.
10. The Severing of the Vas Deferens and It Relation to Neuro-Psychopathic Constitution, by H. C. Sharp, Jeffersonville, Ind.
11. Adrenalin, the Active Principle of the Suprarenal Glands; Its Mode of Preparation, by Jokichi Takamine, New York City.
12. Varicose Veins and Their Treatment, by J. Lively Johnson, Louisville, Ky.
13. Subdural Hematoma from Pachymeningitis Hemorrhagica Interna, by Charles J. Aldrich, Cleveland, Ohio.
14. Some Obscure Injuries which Follow the First Toxic Action of Alcohol, by T. D. Crothers, Hartford, Conn.
15. Sterilization of Rubber Gloves, Catheters, etc., by Formaldehyde Gas; Correct and Erroneous Culture Tests, by A. Goldsphon, Chicago, Ill.
16. Autointoxication and Its Treatment, by Charles H. Shepard, Brooklyn, N. Y.
17. Aboriginal American (Indian) Contribution to Therapeutics, by B. T. Whitmore, New York City.
18. The Bed-Treatment of the Insane, by Frank Parsons Norbury, Jacksonville, Ill.

19. The Clinical Diagnosis of Carcinoma of the Esophagus and the Technique of Gastrostomy, by Charles G. Cumston, Boston.

20. Clinical Notes on Gleet, by A. Ravogli, Cincinnati, Ohio.

21. Dentists' Neck, a Hitherto Undescribed Neurosis, by Albert E. Sterne, Indianapolis, Ind.

22. The Value of Mechanical Appliances in the Aid of Intestinal Suture, by Edward H. Lee, Chicago, Ill.

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33. How Should Appendicitis Cases Be Treated? by Joseph Price, Philadelphia, Pa.

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36. The Surgical Features of Typhoid Fever and Dysentery, by Hal. C. Wyman, Detroit, Mich.

37. Surgical Intervention in Pulmonary Abscess, with Illustrative Cases, by W. J. Macdonald, Albany, N. Y.

38. Report of One Hundred Cases Operated for Appendicitis, by William J. Gillette, Toledo, Ohio.

39. The Surgical Treatment of Diseases of the Stomach, by A. Vander Veer, Albany, N. Y.

40. Some Indications of Gastroenterostomy, by William J. Mayo, Rochester, Minn.

41. The Young Doctor, by Emil Amberg, Detroit, Mich.

42. Fractures, by E. B. Smith, Detroit, Mich.

43. Cancer of the Uterus, by Louis Frank, Louisville, Ky.

44. Floating Liver, with Report of Case, by J. H. Carstens, Detroit, Mich.

45. The Acquirement of Nervous Health, by F. Savary Pearce, Philadelphia, Pa.

And papers are promised by the following: H. N. Moyer, Chicago; N. Stone Scott, Cleveland, O.; C. F. McGohan, Bethlehem, N. H.; Javis N. Jackson, Kansas City, Mo.; H. B. Kinzer, Bristol, Tenn.; A. M. Phelps, New York.

Unusual railroad rates have been obtained for this meeting — a one-fare rate by way of Cleveland, which will enable those taking advantage of these rates to obtain an extension of tickets to October 8 for attendance upon the Buffalo Exposition. A one-and-a-third fare rate on the certificate plan will be in effect via Detroit, Sandusky, and Toledo, with extension of return limit for only three days after the meeting.

Put-in-Bay is an ideal place of meeting, the Hotel Victory a magnificent meeting site.

The address in Medicine will be made by Dr. Frank Billings, of Chicago; the address in Surgery by Dr. Reginald Sayre, of New York City. The Association is to be congratulated on the selection of these two orators, who will acquit themselves in a most scholarly manner.

The annual banquet will be held on the evening of the first day, September 12; the second evening, will be given up to the reading of several papers with stereopticon exhibits and demonstrations; the President's address and the annual orations being delivered on the three mornings of the meeting.

The profession is cordially invited to attend this meeting.

No title can be received after August 20 for publication on the final program.

POW'FUL MED'SIN'.

A COLORED woman threw the odds and ends of medicine left after her husband's death into the fire. The explosion that followed carried the stove through one of the windows. "Mos' pow'ful movin' med'sin' I eveh saw'd," she said. "No wondah de ole man gone died."

AUTOMATIC SAFETY-VALVE STOPPER —A DEVICE PREVENTING THE BURSTING OF PEROXIDE OF HYDROGEN BOTTLES.

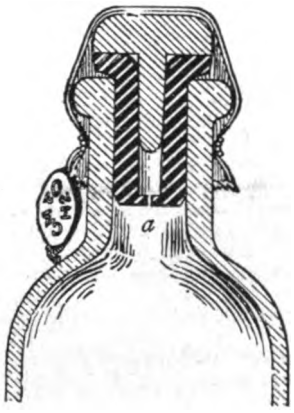
THE great trouble with peroxide preparations is that if the containers are tightly corked, the oxygen which separates and is set free, slowly but constantly as time passes, accumulates until the bottles can no longer stand the pressure, and burst or the corks are driven out. Of the two alternatives, the bursting of the bottles is the most objectionable feature, on account of the danger attached to it.

Containers of the hydrogen peroxide, U. S. P., which is a comparatively weak solution of H_2O_2, yielding but ten volumes of oxygen, may be closed with a wooden stopper, which, by the porous nature of the material, permits the escape of the gas almost as soon as it is set free, thus avoiding explosion and rupture of the bottles or the driving out of the corks.

While these wooden stoppers answer very well for solutions of H_2O_2 corresponding to ten volumes of oxygen or less, with stronger solutions, such, for instance, as Marchand's peroxide of hydrogen medicinal (fifteen volumes), or his hydrozone (thirty volumes of oxygen), they are quickly attacked by the solutions as are also the ordinary corks, and within four months are completely oxidized, not merely bleached, but rendered so soft that they cut like pot cheese. From that time the goods are unfit for sale.

In order to prevent these difficulties, and especially to obviate the bursting of the bottles containing hydrozone, Mr. Marchand, the manufacturer of that article and other well-known brands of perox-

ide of hydrogen, has devised an ingenious stopper, which he calls the "automatic safety-valve rubber cork," and which is shown in the illustrations.



The material of the stopper is vulcanized rubber. The beveled end is punctured through in such a manner that when the pressure in the bottle rises above five to eight pounds to the square inch (according to the thickness of the rubber at the bottom, which may vary slightly), the excess of free oxygen finds free egress, and thus relieves the tension.

This device is first inserted, and a plug of porous wood is then driven in, thus stiffening the rubber and completing the operation of "corking." The capping consists of vegetable parchment covered with paraffined muslin, no wiring being used or needed.

It is easily seen that this style of closing the bottle obviates the possibility of bursting. Assuming even that through some imperfection of the stopper, the puncture should close, as soon as the pressure rises to a point far within that required for rupture of the bottle, the stopper, not being wired down, will yield and be forced out.

Retail druggists who have for so many years been the chief sufferers and losers from the bursting of the peroxide containers, and the deterioration of the substance otherwise from the causes indicated above, will welcome Mr. Marchand's invention as a happy solution of what has to them been a very serious problem in the past, since it will enable them to supply their trade with the higher solutions of hydrogen peroxide, and especially that preparation of Marchand's, for which the stopper was particularly designed, "hydrozone," which carries thirty volumes of oxygen.

The device described above — the automatic safety-valve stopper — having entirely obviated the danger arising from the explosion of bottles in handling, there is certain to be a largely increased demand for Marchand's concentrated solutions of the peroxide of hydrogen (which alone will be corked with the patented stopper), since physicians anxious to obtain quick results will never prescribe anything but the most active solutions, or those richest in active oxygen, and since druggists will be protected absolutely against loss by deterioration or explosion. The medical profession is being thoroughly advised of Mr. Marchand's new method of closing his bottles of "peroxide of hydrogen medicinal" and "hydrozone," and will be certain to avail themselves of the advantages thus guaranteed them.— *National Druggist, of St. Louis, April, 1901.*

NOTE.— Remember there is no popping when corks are removed.

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ORIGINAL ARTICLES.

ETHYL ALCOHOL: ITS BIOLOGY AND ITS RETURN TO PHYSIOLOGY, TO PHARMACOLOGY, AND THERAPEUTICS.[1]

BY WINFIELD S. HALL, A. M., M. D.,
Professor of Physiology, Northwestern University Medical School.

I. THE BIOLOGY OF ETHYL ALCOHOL.

1. The Characteristics of the Yeast Plant. — Ethyl alcohol is one of the normal products of metabolism of the yeast plant; though most species of mucor form alcohol under certain abnormal conditions. The conditions which lead to a formation of alcohol by the white mold-mucor, lead also to a marked increase in the formation of alcohol yeast.

The yeast plant is a fungus. It belongs to the order ascomycetes, distinguished by the formation of two to four spores within the cell body. Besides the spore method of reproduction (which is used only on occasions when there is a scarcity of food, an abundant supply of oxygen or a general lowering of the temperature), the yeast plant possesses another method. The method of reproduction used by this order of plants when all conditions are favorable to vegetative growth is a gemmation, or budding.

Reess grouped all the alcohol-forming ascomycetes into one genus, which is called saccharomyces. He further divided the genus into several species, which are gradually increasing in number as new researches are made. Saccharomyces cerevisiæ is the beer yeast. This species has been subdivided by Hansen into a great number of races or varieties. S. ellipsoideus and S. apiculatus are the principal wine yeasts, though many other species have been described.

The fungi belong to the lowest subkingdom of plants, and are distinguished morphologically by absence of root, stem, and leaf; and physiologically by the absence of chlorophyll, the green coloring matter of leaves and stems.

According to the plan of nature, only those organisms which possess chlorophyll are able to build up complex food substances from simple inorganic compounds. Thus we find the green-leafed cereal grasses building up cellulose, starch, sugar, oil, and proteids from such inert compounds as CO_2, H_2O, and the mineral salts of the soil. The energy which is made latent in this wonderful constructive process is derived from the sunlight by the chlorophyll.

Organisms not possessing chlorophyll are unable to utilize the inert inorganic materials of their environment. They are dependent upon the chlorophyll-bearing plants for their food. Animals live upon the cellulose, starch, sugar, oil, and proteid elaborated by green plants for their own use. Fungi subsist in a similar though perhaps somewhat humbler way, the toadstool and the mushroom appropriating the decaying vegetable matter of field and forest, the yeast plant consuming the sugar of decaying fruits, while mold and bacteria are found wherever vegetable or animal matter is in the process of degenerative change. In fact, it is the presence of these non-chlorophyll-bearing organisms which leads to decay.

2. The Metabolism of the Yeast Plant. — From the above we see that the fungus possesses many points in common with animals. Its life energies are liberated from the highly organized foods which it first consumes, then decomposes.

The food of the yeast plant must contain nitrogenous matter, otherwise there will be a wasting away of the cell substance, as shown by Pasteur. Mayer has shown that this nitrogenous matter may be in the form of such soluble and diffusable proteids as peptone, proteoses, syntonin, or yeast extract. A portion of

[1] Reprinted from the *Medical Review of Reviews*, May and June, 1901.

the nitrogenous matter may also be in the form of ammonium nitrate, tartrate, or oxalate.

Besides the nitrogenous food, there must be carbonaceous food, which is represented by sugar. Then there must be water and salts; the latter must represent iron, potassium, and magnesium in phosphates and in some sulphur combination (not sulphate — Mayer).

As these foods are all soluble, they may be directly absorbed by the yeast cells without the intervention of any digestive process. They are absorbed through the cellulose wall of the yeast cells, and become a part of the cell protoplasm. In this connection we must remember that not all of the substance included under the term "cell protoplasm" possesses that property which we call life, and assimilation has not taken its highest step when a substance enters the cell.

The cytoplasm of the cell is now generally accepted as representing a reticulum (spongioplasm) whose meshes are filled with a fluid (cytolymph). Food substances are absorbed into the cytolymph, where they are s upposed to be held temporarily in store for the use of the active and more highly organized spongioplasm. The spongioplasm is active, while the cytolymph is passive; the spongioplasm has the power to replenish its substance from the food stuffs of the cytolymph. The spongioplasm alone possesses the peculiar property which we call life.

In the manifestation of its life, the spongioplasm may build up more spongioplasm from the various food stuffs, or it may cause an oxidation of food stuff within the cytolymph, without these food stuffs having been built up into spongioplasm. How the cell accomplishes the building up of food stuffs is not known. How it finally causes disintegration of portions of its own living substance is also unknown.

Something is known, however, of the processes by which the living cell-plasma extracts energy from the food stuffs of the cytolymph. A study of the phenomena of fermentation through half a century by hundreds of investigators has revealed the existence of soluble ferments or enzymes, which are the catabolic agents of the living substance.

Enzymes may be either secreted by the cell or retained within the cell: in the first case they perform an extra cellular fermentation; in the latter case, an intracellular fermentation.

Buchner has shown that the yeast plant possesses an enzyme — *zymase* — which has the power, when extracted from the cell, of causing dextrose to break up into ethyl alcohol and carbon dioxide. No one has expressed a doubt that this enzyme is the agent through which the living protoplasm of the yeast cell liberates the energy of the sugar. The zymase is not secreted by the yeast cell, but does its work as an intracellular fermentation.

Very early in the study of alcoholic fermentation it was discovered that when the yeast cell has an ample supply of oxygen, there is a rapid growth and reproduction of the cells; with a much decreased production of alcohol, and a quantity of carbon dioxide out of proportion to the amount of alcohol. On the other hand, with a deficiency of free oxygen there is a great decrease in cell proliferation, while the energy for the life processes of the cell is liberated from the sugar through the action of the enzyme, the reaction being something as follows: $C_6H_{12}O_6$ + latent energy = $2CO_2 + 2C_2H_5CH$ + kinetic energy, which was first suggested by Gay-Lussac, but is now accepted for practical purposes by Oppenheimer.

Kassowitz suggests the following preliminary step in the formula: $C_6H_{12}O_6 = 6\,(HC - H) + 3O_2 = 2CO_2 + 2C_2H_5CH$.

Every living organism absorbs certain food stuffs, assimilates these, and either directly or indirectly causes their catabolism. The catabolism of complex substances results in the formation of a number of substances of simpler composition, which are passed out of the cell or organism.

Among the substances which leave the yeast plant are: CO_2, H_2O, glycerine, succinic acid, ethyl alcohol, and a nitrogenous substance.

But the matter which passes out of living cells may be divided into two categories: (1) Matter which is elaborated within the cells and passes out into the surrounding medium, where it performs a function or serves a purpose advantageous to the cell or to the organism of which the cell may be a part; (2) matter which has been more or less completely catabo-

lized, and, being useless to the cell, is passed out in order that its accumulation within the cell may not clog the vital processes or otherwise injure the cell.

As examples of the first category one thinks at once of the enzymes of the digestive glands, elaborated from substances within the cell-plasma, passed out into the lumen of the alimentary canal, where they induce, in the contents of the canal, chemical changes which are highly advantageous to the organism as a whole. Then there is mucin formed and passed out to lubricate and protect the delicate surface of the alimentary, respiratory, and other membranes; also oil prepared in the sebaceous glands, and thrown out upon the skin to keep it soft and non-absorbent.

As an example of the second category, one may name carbon-dioxide, a product of the oxidation of the carbon of the cell-protoplasm. In the case of the higher animals, urea and uric-acid products of the catabolism of the nitrogenous matter, are good examples of the second group.

The line of division between these two classes of substances is a very clearly marked one. Johannes Müller first made this division, and it has been quite generally accepted. The substances belonging to the first category are called secretions, and those of the second, excretions. The leading dictionaries of medical terms, as Foster's, Gould's, and the Century, recognize the division, and define excretion as waste matter thrown out of an organism. The term "excretion" is used in this sense by physiologists generally.

In the light of the use and definition of the word "excretion" in the literature of nutrition, we can formulate the following definition, which would be acceptable to any modern physiologist: An excretion is any substance (1) which is the product of catabolism of food; (2) from which the organism has extracted the maximum energy possible for it; (3) which would injure the cells that formed it if retained in them; (4) and which is expelled by the cells immediately after its formation.

All the substances mentioned above as leaving the yeast plant fulfill these conditions, and must, therefore, be classified as excretions. In no case could they be looked upon as secretions in the sense in which that term is generally used. No one has ever contended that the yeast plant makes any use of these substances after they are thrown out of the body. The fact is that the yeast cell throws them out because it can get no further energy out of them. They are thus typical excretions.

4. *Biological Significance of Excretions in General, and the Influence of Excretions upon Living Matter.*— The living organism throws out excretions for two reasons: (1) it can make no further use of them; and (2) if retained, the substance injures the organism.

A clinical fact which has been long known and frequently illustrated is that retained urea and uric acid cause profound disturbance of the nervous system, followed by convulsions and death. It is a biological principle universally recognized that the decomposition products of any organism are injurious to that organism. Vaughan expresses this law in the following words: "They (the cells of the body as well as bacteria) are injured when the products of their own activity accumulate about them."

The excreta of bacteria are all classed as ptomains by Vaughan, and he subdivides these into two classes: (1) toxic ptomains, formed in the presence of little oxygen (scarcity of O); (2) non-toxic ptomains, formed in the presence of abundant free oxygen. Quoting further from Vaughan: "It is true without exception, as far as we know, that the excretions of all living things, plants and animals, contain substances which are poisonous to the organisms which excrete them. These poisons originate in the metabolic changes by which the complex organic molecule is split up into simpler compounds."

We must now inquire whether or not alcohol is one of the constituents of the yeast plant excretion which is injurious to that organism. The latest authority on fermentation, Carl Oppenheimer, says: "The question as to how far the cleavage products affect the ferment injuriously can be answered very easily in the case of alcoholic fermentation, since in this case one of the cleavage products, namely, alcohol, is, in a certain degree of concentration, a protoplasmic poison, and injures the yeast and decreases the fermentation. When the alcohol has reached a strength of twelve per cent, the growth of most species of saccharomycetes is much decreased, while with fourteen per cent all activity stops."

Mucor in general and some of the saccharomycetes are much more sensitive to alcohol, one to four per cent being sufficient to stop all further growth as well as fermentation.

Not only will the toxic excretion of any living organism poison the organism which produces it, but it will have a toxic action upon any organism of a higher rank. Thus the excretion of a mammal might serve as food for some of the lower invertebrates, and certainly for fungi and bacteria; while the excreta of the yeast fungus (alcohol) serves as pabulum for the bacterium of acetic acid fermentation. The toxic excretion of the bacteria (toxic ptomains) are, however, poisonous to the bacteria and to the yeast fungus and higher organisms, while the toxic excretion of the yeast (alcohol) is toxic not only to the yeast, but also to all animals.

The biology of ethyl alcohol may be thus summed up: (1) Ethyl alcohol is the excretion of a fungus; (2) excretions which are toxic to the organism which excretes them are also toxic to all higher organisms; (3) alcohol is, therefore, from its inherent nature, toxic to all animal protoplasm.

II. THE RELATION OF ETHYL ALCOHOL TO PHYSIOLOGY, WITH SPECIAL REFERENCE TO ITS RELATION TO NUTRITION.

1. What is a Food?—It is a curious fact that some of the most common and necessary things in life are most difficult to define in concise terms. No short-word formula could adequately define love, or home, or life. Similarly, no short word can define food.

The principal difficulty which one meets in attempting such a definition is to bring into harmony the results of researches which have approached the subject in question from various directions. It must be evident that a definition which takes cognizance of our chemical knowledge only must be defective; one which should take into consideration simply the influence upon muscular work, or upon the action of the nervous tissues, must be defective. In short, a definition of food, to be acceptable to scientists in general, can not be formulated without reference to the best and latest work in the various branches of science which have to deal with foods, and with the nutrition of the body.

How has food been defined?

1. Mc Kendrick, Dalton, and Halliburton give the same definition briefly in the following terms: "Under the term 'food' we include those substances which in the solid or the fluid form are required for the nutrition of the body."

2. Hammarsten, Professor of Physiological Chemistry, Upsala, University of Sweden: "Those bodies are designated as food which have no injurious action upon the organism, and which replace those constituents of the body that have been consumed in the exchange of material (metabolism), or that can prevent or diminish the consumption of such constituents.

3. Gould, compiler of the Medical Dictionary, defines food as "anything used for the nourishment or formation of tissue," and defines nourishment as "anything that enters into the formation of living tissue." So the definition might read: Anything used for the nourishment of, *i. e.*, the formation of, tissue.

4. Howell, editor of the "American Text-Book of Physiology," and Professor of Physiology, Johns Hopkins University, defines food thus: "What we eat and drink for the purpose of nourishing the body constitutes our food. . . . The food is utilized to repair the wastes of the body, *i. e.*, the destruction of the body material, which goes on at all times, . . . and, in addition, it servesa s the source of heat, mechanical work, and other forms of energy liberated in the body."

5. H. Newell Martin, Professor of Biology, Johns Hopkins University, gave the following conditions which a food must fulfill: "(1) A food must contain what it is to replace in the body, either in the form of such substances, or in forms which the body can build up into them; (2) it must be absorbable; (3) neither the substance itself nor any of the products of its transformation in the body must be injurious to the structure or activity of any organ. If so, it is a poison, not a food."

6. Seneca Egbert, Professor of Hygiene, and Frank Woodbury, Professor of Therapeutics, in the Medico-Chirurgical College of Philadelphia, have recently formulated this definition: "A food is any substance which, when taken into the living animal body, is capable, usually after being subjected to the action of digestive organs, of entering through the

absorbent vessels into the general circulation, and of supplying assimilative material and potential energy to the cellular elements of the tissues, and of promoting normal metabolism and general bodily health."

The best definition of food will be the one which takes into account the widest range of facts regarding it. Of the definitions quoted above, those of Howell, Martin, and Egbert and Woodbury are in perfect harmony. They represent the ideas of specialists in physiology, biology, hygiene, and therapeutics.

NATURE'S DEFINITION OF A FOOD.

It is probable that in no other concept which man may wish to define does he get so much assistance from nature as in the case of the term "food." In fact, nature gives a very clear-cut and unambiguous definition of food. Fortunately, she repeats this definition for every different branch of the plant and animal kingdom, so that there need be no misunderstanding.

Nature's food for young mammals is milk. Milk consists of two kinds of protein: of fat, milk, sugar, inorganic salts, and water. It is digested, absorbed, and assimilated by the living cells of the young growing body, and built up by them into cell protoplasm. Incident to the vital processes of the young mammal, portions of the cell substance are constantly being catabolized. Oxygen plays an important rôle in this catabolism, and energy is liberated in the form of heat, or mechanical motion, or nervous energy, or secretory energy. Under the influence of this food the young mammal increases in size and strength.

Nature's food for young birds, reptiles, frogs, and fishes, is eggs. Eggs consist of protein, fats, inorganic salts, and water. Egg material is able to furnish all that the young bird, reptile, frog, or fish needs for the early stage of its growth and development. The protein furnishes the nitrogenous compounds necessary for building up the active portion of every living cell, while the fat furnishes a non-nitrogenous portion of food, also taken within the cells of the growing animal and used there by the living protoplasm of the cells. Eventually it is oxidized, and yields its energy to the body as active heat or motor energy.

Nature's food for the young corn plant is the matter stored away in the corn grain by the mother plant. This food consists of protein, carbohydrates, fats, inorganic salts, and water.

When we subject the animal body to chemical analysis, we find that it is composed of water and solids; we find that the solids are, in turn, composed of organic and inorganic compounds, the former comprising proteins, carbohydrates, and fats, with various extractives representing products of tissue metabolism. The inorganic salts represent the mineral matter of the bones, the salts of the blood and lymph, as well of those of the tissues in general. If we make analysis of various animal organisms, we shall find the tabulated results strikingly similar for all classes of animals. If we make analysis of various foods which nature provides for the young of these various animals, we shall find (1) that there is a striking qualitative similarity in the analysis; and (2) that the food analyses are strikingly similar to the analysis of the animals which they are to nourish, whose tissues they are to build up or repair.

These coincidences are not the result of chance. Nature follows laws graven in the very foundation of living matter. Protoplasm can use as food only substance which it can bring within its cell walls as a useful constituent of cell sap, or cytolymph. Though the food stuff forms a portion of the cytolymph of the cell, it must still undergo anabolic or assimilative changes before it becomes a part of the living, moving, spongioplasm of the cell.

We are now in a position to define a food in harmony with nature's definition. Let us not attempt a brief word formula, but simply state a few of the conditions which a food must satisfy.

1. A food must be digestible and absorbable by the organisms which it nourishes.

2. A food must be assimilable by the living cells of the organism which it is to nourish. By these cells it is first made a constituent of the cytolymph, where it is held in temporary reserve for use by the active spongioplasm, or, perhaps, by the nucleus of the cell.

3. All assimilated foods — all living tissues — undergo catabolic changes accompanied by oxidation; *i. e.*, all assimi-

lated foods are oxidized within the body.

4. All the energy which the animal organism has at its disposal is liberated incident to the catabolism of assimilated foods.

5. The energy which a food supplies is liberated at such time and place as to be beneficial and advantageous to the organism.

No substance can be recognized as a food which is not properly absorbable and assimilable, and whose catabolism or oxidation is not so controlled in time and place as to be advantageous to the system.

The physiological chemist, Bunge, says upon the point: "In determining whether a particular substance is a food, it is not enough to prove that potential chemical energy is changed to kinetic energy. The oxidation must take place at the right time and location; *i. e.*, at exactly the right stage in the activity of particular tissue elements. It must be demonstrated that the kinetic energy liberated can be utilized in the performance of a normal function."

(To be concluded.)

CARCINOMA OF THE SKIN.

BY NEWTON EVANS, B. S., M. D.,
Sanitarium, Battle Creek, Mich.

ETIOLOGY.

Age.—As in the case of all other malignant epithelial new growths, carcinoma of the skin occurs usually late in life, most often between thirty-five and sixty years. Carcinoma may be found, however, at an earlier age, and it has even been reported in the newborn. Williams[1] says that the earliest age at which an undoubted carcinoma has been observed was eleven years, a carcinoma of the rectum in a girl.

Sex.— Statistics including thousands of cases, both in this country and abroad, indicate that carcinomata are much more frequent in women than in men, occurring in about the ratio of five to three. This preponderance is entirely due, however, to the great frequency of cancer of the uterus and breast in women. All other forms of carcinoma including, carcinoma of the skin, predominate in the male sex. Carcinoma of the lip, for instance, is given as being anywhere from seven to twenty times more frequent in men than in women.

The figures for a large number of years, however, indicate that the relative frequency of carcinomata in males is increasing at a rapid rate.

Race.—Certain nationalities seem almost immune to carcinoma, as the natives of Northern Africa, Arabia, and the North American Indians.

Heredity.—Heredity has been shown to be a predisposing factor in the causation of cancer.

Diet.—The question of diet in the causation of carcinoma is a very interesting one. Most of the evidence points to the conclusion that in nations and communities where flesh-food is consumed in large quantities, carcinoma is much more prevalent than among vegetarians. Algeria and the countries of Northern Africa are comparatively free from carcinoma, and the people are largely vegetarians. Reports from India differ as to the frequency of cancer among its people. In Ireland carcinoma is much less common than in England, where much more flesh-meat is eaten; and recently the fact has been noted by physicians in Argentina that carcinoma is very frequent among the Irish in that country as compared with its occurrence among the same classes of people in Ireland, where the amount of flesh-meats consumed is much less. Flesh-meats form the staple, and almost the only, article of diet among thes epeople in Argentina. Verneuil and Reclus hold that the consumption of meat is a very important cause in the etiology of cancer. The herbivorous animals are much less subject to cancer than the carnivorous.

As to the reasons for this close relation between a diet of animal food and the prevalence of carcinoma, there are two possible explanations: one, based on the theory that carcinoma is an infectious disease, is that the virus is transferred directly from the animal to the human being. It has never yet been proved, however, that cancer is due to a parasite, and the fact that no one has yet succeeded in producing carcinoma in any animal by inoculation from an animal of another

[1] *20 Century Practice of Medicine*, Vol. XVII.

species must militate very strongly against this theory.

Another explanation is that the vital resistance of the tissues to the carcinomatous process is lessened by the use of flesh-meats, this condition being produced probably by the toxic extractions of the meat.

FIG. 1

Injury and Irritation. — Senn gives as the essential cause of carcinoma the presence and proliferation in the body of a matrix of embryonic epithelial cells. According to Conheim's theory, this matrix of embryonic tissue is always congenital, and remains latent in the tissue until some exciting cause gives it the stimulus to growth. It seems more reasonable that these embryonic cells are often produced by post-natal influences, as, for example, any injury or wound which, in the reparative process, calls for the rapid proliferation of new tissue, necessarily of the embryonic type, or by repeated mechanical or other forms of irritation which stimulate the cells to rapid proliferation. We have many instances of the first form in the cancers which are found in old scars, as from burns. As examples of carcinoma following irritation, we know that they usually appear at the orifices of the body, and at points subject to repeated irritation, as the lips, nose, cervix, and rectum.

Tuberculosis and other forms of inflammation are often the active cause of irritation. In lupus there is always a proliferation of the surface epithelium accompanying the changes in the corium of the skin, and manifested by the down growth of processes of epithelial tissue into the underlying connective tissue. (See Fig. 1.)

We have in our collection microscopic sections from a case of lupus of the nose, showing true pearl bodies of epithelium, indicating that it undoubtedly was partaking of the nature of an epithelioma. (See Fig. 2.) Large numbers of cases of carcinoma of the skin which have developed from lupus, have been reported.

Displaced Epithelium. — There is no doubt that the displacement of epithelial cells and their inclusion in connective tissue and lymph spaces is the starting point of many carcinomata, as for instance, those which are formed in scars. The experiment of Lack,[1] who produced typical miliary carcinosis by placing the scrapings of an ovary loose in the peritoneal cavity of a rabbit, the epithelial cells from the ovary traveling into the lymphatic channels, and there proliferating, is very interesting as supporting this theory.

Infection. — It has not yet been proved that carcinoma is due to infection by vegetable or animal parasites. A great deal has been written in support of the theory that it is due to infection by some form of ameba, but the four rules of Koch have never been satisfied in the examination of any of these parasites in relation to the etiology of cancers. Eisen, of San

FIG. 2.

Francisco, has made a very interesting report of certain bodies found in squamous-celled carcinomata, which he calls cancriambea macroglossa. He used special methods of fixing the tissues, and discovered bodies of ameboid shape, which react to the stains (methylene blue and eosin) very differently from the epithelial cells of the growth.

Until some of these so-called ameba

[1] Lack, *Journal of Pathology and Bacteriology*, August, 1899.

have been cultivated and inoculated with positive results, they can not be accepted as the cause of carcinoma.

PATHOLOGY.

The essential morphological elements of carcinom are amasses of epithelial cells and a vascular stroma of connective tissue surrounding the epithelium. The epithelial cells are found in tissues where they do not normally occur ("heterotopic growth"—Senn). There are always found signs of chronic inflammation in carcinoma and surrounding tissue, including infiltration of leucocytes and marked arteriosclerosis. The epithelial cells of the new growth have been demonstrated to have ameboid motion, and many can be found undergoing karyokinetic cell division. This rapid cell division is one of the signs of malignancy.

The different pathological varieties depend on the variety of epithelium from which they originate, whether from squamous epithelial surfaces, as the skin and esophagus, or from gland structures, as in the breast and mucous membrane of the endometrium; also upon the relative amount of connective tissue stroma and epithelial cells, and the secondary degenerative changes.

Carcinomata of the skin are of the flat-celled variety, and usually have their

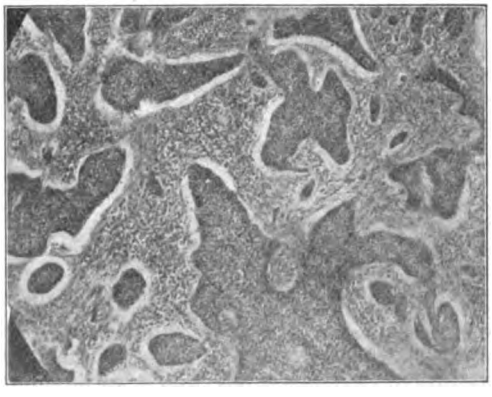

FIG. 3. EPITHELIOMA OF THE NECK.

origin in the surface epithelium, the new cells growing from the malpighian layer; but they are said by some observers to begin in some instances in the glands of the skin.

LOCATION.

They occur most frequently about the head and face, usually about the lips and nose, but may occur in connection with any of the orifices of the body, where the skin joins the mucous membrane, or on any part of the cutaneous surface.

VARIETIES OF CARCINOMA OF THE SKIN.

Carcinomata of the skin vary much in their anatomical characteristics. They may be entirely superficial in the first stages of their growth, called *superficial* or *discoid*, this form being usually small, circular, and slightly raised above the surface. They may exist for a long time without manifesting any of the characteristics of malignancy. Certain tumors of this class, which undoubtedly had the structure of carcinomata, have been known to heal spontaneously, after existing for a number of years. A second variety is deep seated and nodular, growing more rapidly into the subcutaneous tissues, and showing greater tendency to ulcerate. Another form has been described, in which there is a *papillary growth* raised above the general surface. *Rodent ulcer*, in which the growth of new epithelial cells is followed very rapidly by a progressively deepening ulcer, is generally accepted now as being a form of carcinoma of the skin.

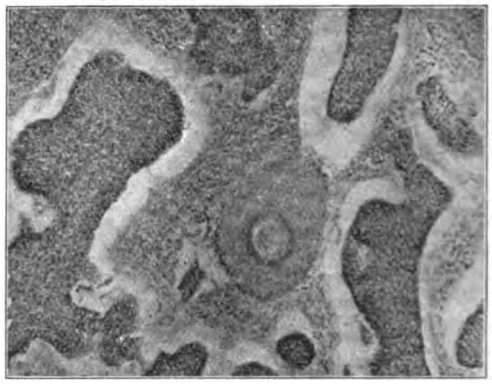

FIG. 4. AN EPITHELIOMA OF THE NECK.

Microscopically there may be distinguished two varieties of carcinoma of the skin, according to Bowen:[1] (1) The lobulated form, in which the epithelium is arranged largely in the form of globular masses, and contains many so-called "pearl bodies;" (2) the tubular form, in which the epithelium is arranged in the form of columns and having few if any pearl bodies.

1 Bowen, *20th Cent. Pract. of Med.*, Vol. XVII.

MALIGNANCY.

Of the different forms of carcinoma, the squamous-celled cancers of the skin are probably the least malignant, and form metastases less frequently and at a later date than other forms. In this respect, however, they differ greatly. Ten to twenty years may elapse before a tumor begins rapid growth, or it may prove fatal within two or three years from its first appearance.

DIAGNOSIS.

The lesions from which it is most difficult to distinguish carcinoma of the skin are tubercular and syphilitic lesions. Tubercular lesions of the skin usually show a tendency to heal, so that scar tissue is found in some portion of the lesion; while thereis no tendency to healing in carcinoma.

Regional infection of neighboring lymph glands is frequent in carcinoma, and does not usually occur in syphilis or tuberculosis. Tubercular and syphilitic lesions of the skin are usually multiple, while carcinoma is single.

In carcinoma there is always a zone of infiltration surrounding the tumor. This does not occur in lupus.

Finally, microscopic examination and inoculation experiments with fragments of the growth will determine its nature.

REPORT OF CASE, WITH RECOVERY.

Male; aged 38; married. Three years ago the patient noticed a point on the side of his neck which would bleed at times without apparent cause. A scab would form at the point; this would scale off, and it would seem to be perfectly well. If the point were irritated, it bled profusely. This continued six months, till the fall of '98. The point then appeared healthy till March, '99, when it began to act in the same way, bleeding and forming scabs. Occasionally there was a little pain. The scabs kept growing larger. In the fall of '99 he accidentally irritated the spot, and it immediately began to swell, and appeared like granulation tissue. It remained about the size of a pea. There were little openings on the surface of the tumor, and oozing continued from the surface. There was a small area of induration around the tumor.

In April, 1900, the greater portion of the tumor was removed for diagnosis. Two weeks later only a small opening was left at the point of the wound. This was touched with carbolic acid, and it completely healed in a few days, and has remained perfectly smooth since — one year. At present a small white soft scar marks the place. The glands of the neck were sightly swollen a few days after the tissue was removed, but not at any other time.

The patient's father has two similar growths on his face.

Microscopical examination of the tumor shows what is undoubtedly the structure of a squamous-celled carcinoma of the skin (Fig. 3). In some sections, pearl bodies are seen, as shown in Fig. 4. In other sections the connection of the large epithelial cell masses with the surface epithelium can be seen.

The patient has lived on a vegetarian diet for the last eight years.

The Bacteriology of Healthy Organs.— Dr. William W. Ford, fellow in pathology, McGill University, Montreal, has elaborated studies on this subject, begun by Professor Adami and Dr. A. G. Nicholls, and has published his conclusions in pamphlet form. The results from autopsies on man were as follows: The colon, staphylococcus, and mesentericus were the common forms of bacteria found, together with a number of long, narrow bacilli like those seen in gangrene. No putrefactive organisms were isolated, and from the similar results of early and late cultures, one is led to believe that, at the time of death, a few bacteria were scattered in the organs, which were capable of development and transplantation, rather than that there was a post-mortem passage of bacteria from the intestine, for example, into the organs.

In several cases a pure staphylococcus was grown, yet a large quantity of gas was evolved from the original culture, smears made directly, however, showing many bacilli, which might be either the gas-producing colon or some pure anærobe, overgrown by the hardier staphylococcus. Anærobic culture in Buchner's jars revealed nothing further to solve the problem.— *Medical Record, June 8, 1901.*

TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

EARLY DIAGNOSIS OF PULMONARY TUBERCULOSIS.

COURTOIS-SUFFIT and Levi Siruge (*Gaz. des Hop.*, Jan. 26, 1901) enumerate first the stigmata of predisposition, mentioning among these pallor, languid, sad expression, fine skin with prominent veins, delicate neck, and in general the picture of morbid beauty. Patients with narrow chest, with scapulæ "winged," chlorotic patients, patients with fine hair of different colors in the different situations, are said to be frequent victims of tuberculosis. As thoracic stigmata are mentioned flattening of the apical regions, shortness of the first three ribs, diminution of the xiphoidal angle. The relation of weight and of chest measurement to the height is often less than normal. Subjects of infantilism and feminism are frequent victims. A small cardiac area with a relatively large pulmonary area in a narrow chest is a frequent sign of predisposition. As instancing "acquired predisposition," may be mentioned the frequent instances of tuberculosis in subjects of smallpox, whooping cough, tracheotomies, diabetes, and alcoholic intoxication. Previous history of pleurisies, asthma, fistula, and Pott's disease are naturally suspicious circumstances. Loss of weight, a neurasthenic condition, slight pain in the chest, digestive disturbances, and slight cough are among the most frequent early symptoms; a deepening of the vocal tone, and in women, suppression of the menses, may arouse suspicion. Hemoptysis may be the first and only sign present. Dilatation of the pupil in the affected side, slight gingivitis, and atrophy of the shoulder muscles may be present. Even when no lesion can be discovered by palpation, inspection, or percussion, auscultation may give suspicious indications, as roughening of breath sounds, with prolonged expiration; or marked weakening of breath sounds may occur.

These signs at the apices, together with slight impairment of resonance, slight resistance, and expiratory blowing (indications of bronchial adenopathy) are given by Fernet as a characteristic syndrome.

Rondot states that first signs may appear at the level of the root of the lung. Jerky inspirations, the result of the heart's action, heard especially as left apex and left front, and subclavicular vascular souffles should attract attention. Some of the first signs to be found by percussion and palpation are slight impairment of note and raising of pitch in the subspinous fossa, increase of vocal resonance. some tenderness about the apices, on even light percussion. Often there is a rapid collapsing pulse, tachycardia (bradycardia is rare), splenic enlargement, slight albuminuria, phosphaturia, and some degree of polyuria. Subjective febrile sensations with malaise, usually toward evening, with no registration of fever thermometrically, normal morning temperature with slight evening rise, slight continued fever, "thermic elevation" after an hour's exercise, and lowering of this temperature after rest of half an hour, in patients with slight fever (Warmemburg and Chuguet), may all be met with. Lowering of arterial and pulmonary pressure occurs. X-rays and the serum method of diagnosis may give valuable results. The tubercular test, if productive of a good reaction, is almost pathognomonic, though not absolutely so. The production of râles and expectoration by potassium iodide has been of some service (Vetlesen, Wells, Landouzz). Puncture of the lung has been done with no bad effects. Examination of the sputum and injection of doubtful sputum into guinea-pigs are the safest and most accurate diagnostic criteria. In infants, the weight, such signs as "spina ventosa," asenitis, enlarged bronchial glands and spleen, the examination of stomach contents and stools for bacilli introduced by the swallowed expectoration, may be of more or less assistance. — *Int. Med. Magazine, July, 1901.*

A New Test for Bile. — Professor E. H. Bartley, M. D., (*American Druggist*, March 11) says that the use of ferric chloride and hydrochloric acid as an oxidizing agent is well known, and is resorted to in the detection of indoxyl in the urine. The method of its use for this purpose is to add to the urine an equal volume of strong hydrochloric acid and

then a few drops of the ordinary test solution of ferric chloride. The potassium indoxyl-sulphate is thus decomposed, and the indoxyl is oxidized to indigo blue. The indigo is dissolved out of the solution by shaking with about two cubic centimeters of chloroform, in which it is soluble. As the chloroform separates, it carries down the indigo and forms a blue indigo-chloroform layer at the bottom of the test-tube.

If this same test is applied to a urine containing bile coloring matters, the solution assumes, on adding the ferric chloride, a beautiful emerald-green color. This green coloring matter is insoluble in chloroform, and hence does not interfere with the indican test. Bile and indican can therefore be tested for at the same time and in the same solution.

The test was first observed by the author in examining feces, and the test was made as follows: An alcoholic extract of the feces was made and filtered clear. To this alcoholic solution hydrochloric acid was added, and then a few drops of ferric chloride solution. An intense green color was immediately produced. This reaction has been tried upon a great many specimens of urine, and no sample not containing bile has been found to give a green color.

The author believes it to be the best, the most characteristic, and the most delicate test we possess for the presence of bile in urine or feces. He has not been able to find in the literature any mention of this process for the detection of bile, although it seems strange that it has not been mentioned, as the reagents are commonly used together in the test or indican. — *New York Medical Journal, March 29, 1901.*

The Etiology of Scarlet Fever.— As long ago as November 18, 1899, a reference to Dr. Class's work on the "Etiology of Scarlet Fever" appeared in the *Lancet*, but the present paper is called forth by the publication of the researches of Baginsky and Sommerfeld, who lay claim to the independent discovery of a characteristic micro-organism in the same disease, which the author considers as probably identical with the one he isolated more than a year ago. The organism in question, which the author found in three hundred successive cases of scarlet fever, is a micrococcus which, when grown on a medium that he describes as "earth agar," forms peculiar large diplococci, resembling in appearance gonococci. Grown on other media and under other conditions, the coccus has very variable appearances, and shows great differences in virulence. He further states that by other observers it has been found in the blood and scales of scarlet fever patients, and he himself has found it in many cases of scarlatinal sore throat, where there were no signs of general infection. It was also found in the blood and urine of a case of surgical scarlet fever.

Experiments on animals show that it possesses decided pathogenic properties, and the author describes certain experiments on inoculation of white swine by intravenous injection of the cultures, whereby a febrile attack was produced, with reddening of the skin, and followed by profuse desquamation. The diplococcus was recoverable from the blood of these animals in pure culture, and on post-mortem examination evidences of nephritis were found. He found further that animals kept in the same cage or pen with those inoculated, not uncommonly developed the same symptoms, thus demonstrating its contagiousness. He further describes an experiment devised to show that blood from a convalescent scarlet fever patient will inhibit the growth of the diplococcus, while blood from a normal child was found to have no such effect; and he found also that blood-serum from the same convalescent patient had the effect of giving a partial protection to white mice which were subsequently inoculated with virulent cultures. He does not, however, record any true "serum reactions" with the organism. It grows freely in milk without producing any visible change in it, and is thereby capable of accounting for the milk-spread epidemics of scarlet fever that have not been unfrequently met with.—*Medical Chronicle.*

Cancer in Children. — Cullingworth reported a case of cancer in an infant only five weeks old; Kaulich, one in a child a year and a half old. Such cases are rare, but the fact should be borne in mind.

Pernicious Anemia.— Th. Rumpf (*Berl. klin. Woch.*, May 6, 1901) publishes the results of his analysis of blood in cases of pernicious anemia. He first turns his attention to the etiology of the disease. He can only explain the disease by looking on it as a combination of symptoms due to various causes. Of these he mentioned bothriocephalus latus in the intestine — a very rare cause; carcinoma, especially of the stomach; pregnancy and parturition; syphilis; insufficient nutrition; and pathological conditions of the gastro enteric canal. Besides causes due to or following one of these conditions, he calls attention to those cases for which no cause can be ascribed, — cryptogenetic pernicious anemia (Birch-Hirschfield).

He says that just as ill understood as the etiology of the disease is the actual condition of the blood. The microscopical appearances are well known, but the true chemical changes have almost entirely been neglected.

He conducted experiments with Dennstadt. They examined the blood of two still-born fetuses as a control, and further compared the results with those obtained by Schmidt and other analysts. They found that the blood in pernicious anemia contained a larger amount of water than normal blood, a smaller quantity of solids, a higher proportion of chlorine, and a lower proportion of potassium, iron, and fat. The deficiency of potassium is more evident when a comparison is made with the quantity of sodium and of chlorine. In pernicious anemia there is not sufficient sodium to "cover" the chlorine, and the potassium also is present in too small quantities to combine with all the free chlorine. In normal blood there is an excess of sodium when estimated by the side of chlorine, without any of the potassium being needed to take up the chlorine.

They further examined various tissues of the body, and found that the proportion of water was higher than normal in the heart, but considerably lower in the liver, spleen, and brain. The solids were in excess in the heart, and especially in the liver and spleen. There was also a deficiency of sodium to cover the chlorine in the liver and spleen; while in the former, potassium was present in a higher proportion than normal, and in a lower proportion in all other organs.

Making his deduction from these investigations, he turned them to practical use by treating pernicious anemia with potassium carbonate, tartrate, and citrate. — *British Medical Journal, July 3, 1901.*

The Behavior of the Blood Pressure in the Treatment of Chronic Heart Disease.— Schott (*Deut. Med. Woch.*, 1901, Nos. 22, 23) records the results of his investigations into condition of the blood pressure in cardiopaths while under gymnastic and balneic treatment. He states that he has been led to do so mainly by the fact that many other observers have extended the domain of these therapeutic measures far beyond the limits laid down by him and his brother, and have even considered the contraindications noted by them to be indications. Schott has employed the sphygmomanometer in preference to the sphygmograph for recording the pulse curve; he finds that the results given by Basch's instrument are apt to be inaccurate when there is arterio-sclerosis, and is inclined to recommend the apparatus of Riva-Rocci. For the rapid mensuration of variations in the blood pressure he uses Gaertner's tonometer; he lays great stress on the observance of precautions often neglected, as to its being always used under identical conditions. He recommends that the hand to which the instrument is applied should always be held at the level of the heart; the pressure recorded invariably falls as the hand raises. The non-observance of this rule has led other writers to state that balneotherapeutics have caused a fall in the blood pressure when the Schotts have found a rise.

The most recent investigations of the author show that gymnastic treatment leads, in healthy people and in cardiopaths in whom it is indicated, to a rise of blood pressure, while massage produces little or no effect. Treatment by baths also, if it is doing good, raises the blood pressure, after a while persistently; where it is contraindicated, as in acute heart disease, advanced myocarditis and arteriosclerosis, and aneurisms of the heart and great vessels, a marked fall occurs, together with a rapid, small pulse and accelerated respirations. The effects of the baths upon the tonometer tracing can be thus used as prognostic and therapeutic

indications, and the investigations of the author upon the human subject confirm the results obtained by Heidenhain upon animals.—*British Medical Journal, July 31, 1901.*

Cold Bath in Delirium Tremens.—Salvant (*Thèse de Paris*, 1901) states that the treatment of febrile delirium tremens by baths at 18° C., or tempered according to individual cases, constitutes a therapeutic method of choice capable of inducing rapid resolution of symptoms. The temperature being reduced, the motor and sensory hyperexcitability usually disappears. Salvant argues that by using this plan of treatment the infection and autointoxication are directly antagonized. The method is then a pathogenic one; and not only symptomatic, as is the treatment by sedative drugs, bromides, chloral, etc. Well-marked cardiovascular disease is, however, a contraindication to its employment.—*British Medical Journal, July 13, 1901.*

Causes of Visceral Ptosis.—Dr. Byron Robinson (*Lancet Clinic*) from observations covering a period of ten years, states that visceral ptosis is chiefly due to three great factors; viz., (*a*) Elongation and separation of fascial fibers of the abdominal wall, especially along the linæ alba and lineæ semilunares; (*b*) Elongation and separation of muscular fibers of the abdominal wall, particularly in the form of diastasis of the musculi recti abdominales; (*c*) Gastroduodenal dilatation from pressure of the superior mesenteric artery, vein, and nerve on the transverse segment of the duodenum. Since mesenteries are not intended for such mechanical support, the viscera follow the yielding abdominal wall, resulting in visceral ptosis. Persons with visceral ptosis suffer from neurosis due to trauma of the nerves in the abdominal wall. Visceral ptosis which deranges visceral motion, sensation, secretion, and nourishment, gastroduodenal dilatation, and relaxed abdominal walls, he finds to be a very frequent disease.—*The Medical Age.*

Treatment of Lumbago and Sciatica.—Lafond Grellety has obtained very satisfactory results in the treatment of lumbago and sciatica, by friction with chloral liniment (*Journ. de Med. et de Chir. Pratiques*, January 10, 1901). In many of his cases other methods of treatment have proved unsatisfactory. The writer's method was to rub vigorously the whole of the painful area for ten minutes night and morning, with a liniment consisting of equal parts of chloral hydrate and olive oil. The chloral before being mixed with the oil should be dissolved in the smallest possible amount of water. Unless this is done, the chloral separates in flaky masses. The mixture requires to be prepared fresh each time. It is also possible to employ lime water in the solution of chloral in oil so as to form a kind of emulsion.—*British Medical Journal, April 20, 1901.*

The Saline Treatment of Dysentery.—W. J. Buchanan, M. B., in the *British Medical Journal* for February 10, 1900, published a note on the results of treatment of dysentery by salines, based on 555 cases, with only six deaths. The present note deals with the results of 300 more cases which have been treated with salines, with only 3 deaths, thus making a total of 855 cases with death, or a mortality of about 1 per cent. The saline treatment is advocated for acute cases only; it is not safe for chronic or relapsing cases with ulceration of the colon. The following mixture was used:—

℞

Sodii sulphatis - - -	1 dram
Aquæ foeniculi, ad - - -	1 ounce

This was given four, six, or eight times a day as required, and continued until every trace of blood and mucus had disappeared from the stools.—*New York Medical Record.*

The Effects of Alcohol and Coffee.—The *Medical Press* recently called attention to the fact that coffee may produce effects similar to those induced by alcohol, among which are palpitation, a feeble pulse, trembling, twitching of the limbs, and other indications of profound poisoning. This fact is one to which coffee drinkers should give attention. The use of tea and coffee is only a respectable sort of tippling, the effects of which may be as injurious as those following the use of alcoholic drugs.

Living Animal Organisms in the Ear.— Francis R. Packard (*Penn. Med. Jour.*) says that as a rule any animal within the ear may be killed, and it remains removed, by proper syringing with a rather strong solution of carbolic acid in warm water. In some instances merely holding a light in front of the external auditory meatus has served to attract the insect, and cause it to make its way out; but the best way to produce relief is to flood the meatus with warm water or oil. C. H. Burnett recommends the use of chloroform through the meatus. Dr. Blake removed the maggots from a suppurating ear by holding a sponge saturated with ether at the external meatus. This caused all the maggots to wriggle out from the canal. Sometimes examination with a speculum has failed to reveal the presence of anything abnormal within the ear, and yet syringing will remove an insect.— *The Am. Jour. of Obst. and Dis. of Women and Children, June, 1901.*

The Old Father Satisfied.— Twenty years ago a discouraged young doctor in one of our large cities was visited by his old father, who came up from a rural district to look after his boy.

"Well, son," he said, "how are you getting along?"

"I'm not getting along at all," was the disheartened answer, "I'm not doing a thing."

The old man's countenance fell, but he spoke of courage, and patience, and perseverance. Later in the day he went with his son to the "Free Dispensary," where the young doctor had an unsalaried position, and where he spent an hour or more every day.

The father sat by, a silent but intensely interested spectator, while twenty-five poor unfortunates received help. The doctor forgot his visitor, while he bent his skilled energies to this task; but hardly had the door closed on the last patient, when the old man burst forth:—

"I thought you told me that you were not doing anything! Why, if I had helped twenty-five people in a month as much as you have in one morning, I would thank God that my life counted for something."

"There isn't any money in it, though," explained the son, somewhat abashed.

"Money!" the old man shouted, still scornfully. "Money! What is money in comparison with being of use to your fellow men? Never mind about money; you go right along at this work every day. I 'll go back to the farm, and gladly earn money enough to support you as long as I live,— yes, and sleep sound every night with the thought that I have helped you to help your fellow men."— *American Medical Missionary.*

Infantile Scorbutus.— Morse (*Boston Med. and Surg. Jour.*, May, 1901) states that the treatment of this condition consists in the regulation of the diet and the administration of orange or lemon juice. Many cases will recover on either method alone, but the combination is far preferable. The diet should be that suitable for the infant of the given age— breast milk, modified cow's milk, and beef juice. The juice of a half or whole lemon or orange should be given daily. It almost never disturbs digestion. No drug is of the slightest utility in the treatment of this disease. Complicating gastroenteric disturbance should be treated symptomatically.

THE "sport" of pigeon shooting should be looked after, if possible, by physicians, so long as the S. P. C. A. people feel that they must fritter away their energies in sham agonies over scientific uncruelties. Last week in an eastern State, about 20,000 pigeons were shot or maimed by several hundred "sportsmen," in the interests chiefly of gun-manufacturers and powder-makers. The atrocity of this cruelty is a thousand times as great as that in all the laboratories of the world during years, and almost rivals that of the shipments of cattle and horses across continents or oceans. If the antivivisectionists only hated cruelty as much as they hate medical science, they would have long ago secured the passage of laws prohibiting trap-shooting. The shame of live pigeon shooting is heightened by the fact that by mechanical devices, clay-pigeon shooting is as perfect a test of markmanship. — *American Medicine, April 3 1901.*

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

Diphtheria Bacilli in Noma.—Joseph Walsh ("Proceedings of the Pathological Society of Philadelphia," June, 1901) reports eight cases of noma, all of which showed in cultures the true diphtheria bacillus—that is, the true diphtheria bacillus as measured by the criteria of to-day. For his differentiation of it from others and the pseudo-diphtheria bacillus, he followed Sternberg as to its growth on different media, and Neisser and others in its staining qualities. Each organism was proved also by inoculation into guinea-pigs or (in one case) a rabbit. The amount inoculated was routinely small, and was taken from a growth on Löffler's blood-serum. Only one of the eight cases showed a pure culture of diphtheria organisms, and that one was in association with diphtheria. The others showed besides very large bacilli, diplococci, etc.

The author concludes that since noma is a species of moist gangrene, requiring probably from analogy two different micro-organisms, one a saprophyte to produce putrefaction, another a parasite to produce the primary narcosis, it is possible that in those cases where diphtheria bacilli are found they may be the primary causative agents. When other pathogenic micro-organisms capable of producing necrosis are found, it is possible that they may be the primary excitants.—*American Journal of Obstetrics and Diseases of Women and Children, July, 1901.*

Bacteria in the Uterus after Labor.—Wormser (*Best. i. Geb. u. Gyn.*, Bd. iv, H. 1) states that although the presence of bacteria in the uterine cavity during the first week after labor is abnormal, this is not true at a later period. He bases this opinion upon the fact that he discovered germs in the uterus between the eleventh and eighteenth days in 84 out of 100 cases who had had no temperature during the puerperium.

The investigations of G. Vogel (*Zeit f. Geb. u. Gyn.*, Bd. xx, H. 3) show that bacteria are found in the uterus in the greater number of cases of fever during the puerperium. In such cases, with bacteria present there is usually some abnormality of the genitals. There is usually a retention of lochia, which may result from latero-version of the uterus or other causes. The discharge should be hastened by stimulating to cause uterine contraction, and irrigation of the uterine cavity followed by injection of a 20-per-cent alcoholic solution of carbolic acid should not be too long delayed. Cervical lacerations favor the ascent of bacteria into the uterus. Small wounds of the genitals aid the development of germs, and greatly increase the danger. For this reason, thorough previous cleansing is indicated. In the normal puerperium the uterine cavity is usually sterile at first, though bacteria, even the streptococcus, may be present without causing symptoms. Later the secretion of the normal puerperal woman frequently contains bacteria, though no fever is usually caused by them. Streptococci are comparatively seldom found in the puerperium when there is no fever.—*American Journal of Obstetrics and Diseases of Women and Children, July, 1901.*

The Bacteria We Eat. — According to a Russian savant, M. Lakerbekoff, who carried out an elaborate inquiry into the bacterial quality of the milk supplied to St. Petersburg, the condition of affairs in that city is appalling. Milk described as the purest obtainable, was found to contain a minimum of over 10,000,000, and a maximum of over 83,000,000 bacteria in from twenty to twenty-five drops; while in other samples a minimum of 20,000,000 and a maximum of 114,000,000 were found. Such pollution as this is unnecessary, for milk under normal, healthy conditions contains very few bacteria as it issues from the cow. Indeed, some authorities consider that it is absolutely devoid of microbic life. If due precautions are taken in keeping the cows and their stable clean, if the milker is made to keep himself and his clothes in a thoroughly clean condition, milk can be placed upon the table which is practically free from all micro-organisms. Of course, the milk-cans require proper attention, and the cows ought to be under the supervision of a veterinary surgeon. — *Exchange.*

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UNPHYSIOLOGICAL ADVICE.

IN a recent number of one of our excellent contemporaries, we find an article on dietetics with which we feel compelled to take decided issue. The writer says: —

"I am of the opinion that fasting during the long interval between supper and breakfast, and especially the complete emptiness of the stomach during sleep, adds greatly to the amount of emaciation, sleeplessness, and weakness we so often meet.

"Physiology teaches that in the body there is a perpetual disintegration of tissue, sleeping or waking; it is therefore logical to believe that the supply of nourishment should be somewhat continuous, especially in those who are below par, if we would counteract their emaciation and lowered degree of vitality; and as bodily exercise is suspended during sleep, with wear and tear correspondingly diminished, while digestion, assimilation, and nutritive activity continue as usual, the food furnished during this period adds more than is destroyed, and increased weight and improved general vigor is the result.

"All beings except man are governed by natural instinct, and every being with a stomach, except man, eats before sleep, and even the human infant, guided by the same instinct, sucks frequently day and night, and if its stomach is empty for any prolonged period, it cries long and loud.

"Digestion requires no interval of rest, and if the amount of food during the twenty-four hours is, in quantity and quality, not beyond the physiological limit, it makes no hurtful difference to the stomach how few or how short are the intervals between eating."

The able writer who penned the above paragraphs seems to have overlooked several important physiological facts: —

The body is not fasting between supper and breakfast. Observations show that the time required for the complete transit of a meal from the stomach to the colon is fourteen hours,— in other words, from the time one eats his supper at six o'clock until the food taken is passed through the intestine and deposited in the colon, is fourteen hours. It is evident, then, that absorption is taking place during that entire period, and although food is not taken into the stomach, the body is nevertheless being fed. Modern researches have clearly proved that little or no absorption takes place in the stomach; consequently it is not a matter of importance that the stomach should contain food for any considerable length of time; the sooner it is emptied, in fact, the better, for the majority of people. Bouchard has pointed out that when food is retained in the stomach more than five hours after eating, fermentative and putrefactive processes begin, because of the presence of germs and the withdrawal of the hydrochloric acid, which begins, as shown by the observations of Hayem and Winter, within two and a half hours after the taking of the meal. It is clearly evident, then, that the primary reason assigned by the writer above referred to, for eating at night, is not a good one; in fact, it does not exist.

Another fact of importance is worth noting: the constant presence of acid gastric juice in the stomach acts as an irritant to the gastric mucous membrane, and gives rise to congestion, and when the gastric fluid is intensely acid, may,

in time, result in ulcer. It must be remembered, also, that the gastric glands, like the nerve centers and muscles, become exhausted by their work, and require time for rest.

The taking of food at night, in a certain proportion of cases, does promote sleep, and it is doubtless this fact which has led the doctor to his conclusions respecting the benefits of a small meal just before retiring. The true explanation, however, is to be found in the influence of food upon the portal circulation. The portal veins are capable of containing all the blood in the body. When the visceral circulation is stimulated by the presence of food in the stomach, the amount of blood contained therein is greatly increased, and by this means the amount of blood in the brain is very considerably diminished; and if the patient is suffering from insomnia as the result of cerebral congestion relief will be obtained. A late meal, of a small amount of some simple food, is certainly preferable to the loss of a night's sleep; but the same results can be accomplished in a much more satisfactory and physiological way. A hot foot-bath, taken just before retiring, and followed by a moist abdominal bandage — the so-called "Neptune's girdle" — is a far better means of securing sleep by diverting blood from the brain, and at the same time gives the stomach an opportunity to enjoy much-needed rest. Cerebral activity is essential for perfect digestion, while the digestive process interferes with sound sleep by irritating the cerebral cells through reflex nervous activity.

After more than twenty-five years' experience in treating chronic invalids, among whom have been many hundreds of persons suffering from the inability to sleep well, and in many cases subject to most inveterate insomnia, the writer has no hesitation in stating that the withdrawal of the evening meal is one of the most important factors in securing natural sleep.

When persons complain of inability to sleep because of a sensation of emptiness of the stomach, it has been found advantageous to allow the patient to take a glass or two of fruit juice, without cane sugar, or the juice of two or three oranges, or even a little ripe fruit at bedtime. Fruit furnishes nutrient material, and is ready for immediate absorption, hence does not tax the digestive organs, while it does relieve the sensation of discomfort, or "goneness," which may sometimes be the cause of sleeplessness. The popular idea that fruit at night is unwholesome is entirely without foundation. It is only when the fruit is combined with cream and sugar, butter containing colon germs, cake, pie, and other indigestibles, that it is likely to create disturbance, and even then the fruit is not blameworthy, but rather the bad company in which it finds itself. If any food must be taken at night, fruit is preferable to everything else.

MEAT DIET AND RHEUMATISM.

THE meat diet fad started a score or more of years ago by Dr. Salisbury, of Cleveland, entered upon its decline long ago, but there are to be found in the profession a few belated brethren who still cling to the long-since exploded policy that consumption, Bright's disease, rheumatism, and most other human maladies are due to the ravages of the yeast plant, which Dr. Salisbury supposed to be roaming up and down the blood channels of the body, making havoc, like a wild bull in a China shop.

Some years ago the writer had a favorable opportunity for investigating the facts upon which this delusion is based. Having been called to the city of Cleveland to see a gentleman who was sick with Bright's disease, we learned that he was a neighbor and personal friend of the great Dr. Salisbury, and had been under

his care for a number of years and following his method of treatment most assiduously. He was at this time under the immediate supervision of a nephew of Dr. Salisbury, who had been the doctor's special assistant for many years, and acted as his specialist in the examination of the blood and feces. Having had a longing curiosity to see the wonderful yeast cells in the blood, of which Dr. Salisbury and his disciples gave such soul-harrowing accounts, we asked the patient to send for the doctor to come, and bring along his microscope and everything necessary for making an examination of the blood and feces. He was accordingly telephoned for, and in the course of half an hour appeared.

A specimen of blood was at once obtained and examined. The mode of procedure was this: A drop of blood was placed upon a slide, a glass cover was placed over it, and the doctor then took the slide and cover-glass between his thumb and finger, and rubbed them together with a firm pressure for several minutes. At the end of this time the slide was placed under a microscope, and the doctor at once exclaimed, "Yes, here are yeast cells, plenty of them, gathered together in great masses." When allowed to place an eye at the eye-piece, we discovered that the so-called "yeast-cells" were not yeast-cells at all, but simply an aggregation of crushed white blood cells, which had been broken up by the manipulation referred to. We explained to the doctor that the objects in the field were not yeast cells, but the nuclei of dead fragments of leucocytes. He took another look, revised his diagnosis, and hunted up another agglomeration of broken leucocytes, which he assured us were true yeast cells; but a single glance was sufficient to show that they were of the same nature as the others. The doctor then concluded that "yeast cells were not so abundant as usual this morning," and that "the patient must be better." It occurred to us to inquire of the doctor whether he had ever taken pains to plant a drop of blood in a culture medium, and watch the yeast cells grow. He hadn't done this, and we did not think we would run any risk in suggesting to him that we would be glad to give him $25 apiece for every specimen of yeast which he would cultivate from yeast cells found in the blood. We never heard from him. Any physician who still clings to the ridiculous theories advanced by Dr. Salisbury, and upon which he bases his practice of meat eating, is too far beyond the march of medical progress to be considered a scientific medical man.

Patients whose stomachs are full of yeast and acid-forming germs are often temporarily relieved by the use of a diet of toast and steak. Meat is an easily digested food, and does not ferment; but the temporary relief afforded by an exclusive diet of meat is certain to be followed later by a whole series of nutritive disorders, resulting from the overstimulation of metabolic activity, produced by an excess of nitrogen alimentation, and from the accumulation within the body of uric acid, purin bases, and various toxic waste substances necessarily present in flesh-meats of all descriptions.

A glance at the following table, which we quote from an article by A. Robin in the *International Medical Magazine* for March, ought to be sufficient to persuade anybody of the folly of a meat diet for one suffering from rheumatism: —

URIC ACID IN FOODS.

Uric Acid and Xanthins.

Substance	Per cent.	Grains per lb.
Lamb (cold roast leg)	.0500	3.50
Soup (made from bones)	.0068	0.48
Soup (made from meat)	.0202	1.40
Hospital beef-tea (cooked 8 hrs.)	.0980	7.00
Saddle of mutton	.0200	1.40
Mutton (cold roast leg)	.0160	1.10
Veal (cutlet)	.0490	3.50
Beef (cold sirloin)	.0160	1.10
Kidney of sheep	.0490	3.50

Liver of sheep	.0910	6.50
Fowl (breast)	.0240	1.70
Rabbit	.0150	1.00
Mackerel	.0320	2.00
Mackerel (boiled 15 min.)	.0150	1.00
Plaice	.0039	0.20
Herring (fresh)	.0040	0.20
Herring Loch Erne (kippered)	.0900	6.40
Herring (bloater)	.0310	2.20
Beefsteak (treated raw)	.0190	1.30
Meat juice	.6970	49.70
Meat extract	.8830	63.00
Tea	2.5000	175.00
Coffee	1.0000	70.00
Cocoa	48.00	59.00

A case recently under the writer's observation, illustrates the mischief that may arise from the so-called Salisbury method: —

For two or three years the writer has had under occasional observation a case in which the uric acid diathesis was distinctly developed. The patient was not under the writer's care, but was seen a few times in consultation. Among other symptoms, joint pains and enlargements were present. Two years ago this patient was induced to place herself under the care of a physician who placed her on the so-called Salisbury diet. "Salisbury steaks" constituted her principal food for nearly a year. The patient steadily got worse until she finally became bedfast, and in this condition the writer was again called to see the case in consultation. A warning had been given, at first, of the probable consequences of this regimen, but he was quite unprepared to see such extensive damage as was found.

Physical examination showed that the disease in the joints had made rapid progress, but the worst consequences of this exclusive meat diet were to be found in the liver and spleen. The spleen had recently taken on a very decided enlargement, having increased to about four times the normal size. It was slightly displaced downward by its weight, and was sensitive to pressure. The liver, on the other hand, was contracted to scarcely one half its proper size, evidently the result of changes set up by the extractives of meat with which the system had been so completely saturated.

By request, the patient was at once taken in charge, and placed on a uric-acid-free diet. The joints were wrapped in cotton and wool, and covered with mackintosh. Copious water drinking was resorted to, and tonic hydriatic measures administered; cold applications consisting of cold-mitten friction, wet-hand rubbing applied two or three times daily, and light massage were also administered. Within two days the improvement was very decided. Although the patient had for months been unable to sleep without the use of hypnotics, the second night she slept soundly. The expression of pain and extreme depression constantly worn upon the face disappeared. Though the weather was decidedly unfavorable for a rheumatic, the case improved in every particular, and up to the present time the improvement has continued.

This case is not an isolated one. The writer has met scores of similar cases, not always so decidedly marked, but often worse in some particulars, which illustrate the disastrous effects resulting from compelling a patient to subsist upon a meat diet, which is as unnatural for a man as for a horse or sheep. By his structure and his biological classification, man's natural dietary is identical with that of the chimpanzee and the orang-outang, which subsist upon fruits and nuts and soft grains. It is the testimony of every physiologist that man can not possibly subsist upon an exclusively carnivorous diet. That a person is able to tolerate the so-called Salisbury diet for any considerable length of time is wholly due to the large quantities of water which are administered in connection with it.

This fad has been tolerated long enough, and it seems to be high time that it was set aside, along with the other medical delusions which have temporarily

reigned in the medical profession, and have been relegated to the category of obsolete and pernicious practices.

C. E. S.

MEAT AND MILK IN HYPERPEPSIA.

For years it has been the fashion to prescribe either a milk diet or a meat diet in cases of hyperpepsia, or hyperchlorhydrie. The theory favoring the use of meat has been, that it affords relief by neutralizing the hydrochloric acid which combines readily with the albuminoid constituents of meat, resulting in the formation of combined chlorine, the irritating effects of which upon the gastric mucous membrane are far less than that of free HCl. The theory in reference to the use of meat has been that the acid not only combines with the casein, thus lessening the amount of free HCl, but that milk exercises a favorable influence in lessening the secretion of HCl.

Pawlow has, within the last two or three years, published several interesting observations which show conclusively that while a meat diet does temporarily lessen the amount of free HCl present in the gastric juice, the presence of flesh foods in the stomach gives rise to the formation of an increased amount of HCl by stimulating the gastric glands, so that the effect of a meat diet is to increase the intensity of the hyperpepsia, or hyperchlorhydrie, notwithstanding the temporary relief afforded. Since the publication of Pawlow's observation, specialists in the treatment of gastric disorders who keep themselves abreast of progress in this line of therapeutics have revised their prescriptions, and, following the results of Pawlow's experiments, have placed their patients upon a diet of dextrinized cereals and foods possessing only a moderate degree of peptogenic power. Milk has still been relied upon, to a considerable extent, however, as a food remedy in these cases, especially in gastric ulcer due to hyperchlorhydrie.

But H. de Besse (*Annal. de la Polyclin de Lisle*) now comes forward with a series of experiments relating to the chemistry of digestion, in which he demonstrates very clearly that milk is wanting in both the particulars in which it has been relied upon as a remedy in these cases. The casein of milk combines much less readily with HCl than has formerly been supposed, hence its neutralizing power is deficient; while, on the other hand, instead of lessening the secretion of HCl, as was believed to be the case, it is clearly shown that it has the opposite effect, at least in a considerable number of cases, actually increasing the total acidity and the free HCl. This explains the practice which clinical observation has led many to adopt, — of administering bicarbonate of soda, or lime-water, with milk to prevent the development of hyperacidity. It has for many years been the writer's practice to forbid the use of milk in cases of gastric acidity, substituting alum milk or cream, malted nuts, or some other similar preparation.

THE RATIONAL TREATMENT OF THE INSANE.

The routine treatment of the insane, which has prevailed, especially until recent years, in many public institutions, is still quite too much in vogue, and has been a crying disgrace to the medical profession. No other class of patients have so poor a chance of recovery as the insane. In many instances the treatment to which they are subjected is nothing more nor less than a "meditation on death." Subjected to a routine diet, more or less routine medication, and herded together with multitudes of others suffering in the same way, or worse, these unfortunates have very little opportunity for restoration to health compared with the more favored classes of invalids.

It is interesting to note that there are many indications of improvement. The largest insane hospital in Philadelphia has for some years been employing hydrotherapy with remarkable success in dealing with all classes of the insane. Various other institutions are recently adopting the hydriatic method. The editor of the *Philadelphia Medical Journal*, referring to this fact, remarks: "We know on good authority that in one hospital in Philadelphia they are making more and quicker cures in insanity since they introduced hydrotherapy and resort more to bed treatment. These means save the nutrition of the neurons, and that is the first and last indication in insanity. Drugs will not do it. During convalescence, an outdoor life, and then possibly a little change of scene, are indicated."

ARTERIOSCLEROSIS.

ONE of the most deadly of all known human maladies is that of disordered nutrition, which gives rise to characteristic changes in the blood-vessels to which the term "arteriosclerosis" has been applied. The hardened and gradual shrinking of the arteries gives rise to a loss of function in the part affected, and, when general, results in premature senility and death. Dr. Jones, of St. Paul, Minn., read before the Association of Life Insurance Examining Surgeons, in St. Paul, Minn., last June, a valuable and interesting paper, in which he pronounced arteriosclerosis to be the greatest foe of life insurance companies. In his discussion of this important subject, Dr. Jones charges the occurrence of this disease among young and middle-aged persons to the use of alcohol, tobacco, absorption of intestinal ptomains from indigestion, flesh eating, and to the damaging effects left behind by syphilis, rheumatism, and lead poisoning. He remarks, also, that the poisons of certain fevers, especially malaria, stand in a causative relationship.

"The town dweller and wealthy eat too much meat." In referring to the treatment of this disease, the writer insists especially that the amount of flesh foods consumed should be curtailed. The whole paper is an interesting and timely one, and is worthy of careful perusal.

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HOWARD RAND, M. D., Urinalist.
NEWTON EVANS, M. D., Pathologist.
ELMER L. EGGLESTON, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR AUGUST.

Gastric Laboratory.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	82	97.5	17	100	99	84	198	90
Less than 10,000 bac.								
Between 10,000 and 100,000 bac.					4	3	4	015
More than 100,000 bac.	2	2.5			16	13	18	085
Total	84	100	17	100	119	100	220	100

Patients received from the following States: Ontario, 9; Illinois, 27; Missouri, 4; Virginia, 4; North Dakota, 3; Indiana, 24; Ohio, 28; Minnesota, 5; Kentucky, 9; New York 11; New Jersey, 2; Michigan, 38; Iowa, 10; Texas, 4; Tennessee, 4; Manitoba, 1; Arkansas, 3; Northwest Territory, 1; Florida, 3; Pennsylvania, 9; Mississippi, 2; Alabama, 3; Montana, 1; Wisconsin, 4; California, 1; Jamaica, 1; Nebraska, 1; Colorado, 2; Arizona, 1; Arkansas, 2; South Africa, 1; Canada, 2.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
100 per cent and over	93	34	127
90–100 " "	95	83	178
80– 90 " "	29	58	87
70– 80 " "	5	15	20
50– 70 " "	14	17	31
Below 50 per cent	3	2	5
Total	239	209	448

Red Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	78	13	91
4,500,000 and 5,000,000	89	49	138
4,000,000 " 4,500,000	34	95	121
3,500,000 " 4,000,000	9	38	49
3,000,000 " 3,500,000	10	11	27
2,500,000 " 3,000,000	8	3	11
Below 2,500,000	11	0	11
Total	239	209	448

Examinations of Sputum.— There were 23 examinations made, 21 being new cases. Tubercle bacilli were found in 4 cases.

Urinary Laboratory.—Total number of specimens examined, 843; number of new cases, 356; number of albumin cases, 18; number of sugar cases, 11; number of casts cases, 13; number of pus cases, 35; number of blood cases, 1.

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MODERN MEDICINE

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ORIGINAL ARTICLES.

ETHYL ALCOHOL: ITS BIOLOGY AND ITS RETURN TO PHYSIOLOGY, TO PHARMACOLOGY, AND TO THERAPEUTICS.[1]

BY WINFIELD S. HALL, A. M., M. D.,
Professor of Physiology Northwestern University Medical School.

(Concluded.)

OTHER DEFINITIONS OF A FOOD.

THESE conditions, which have been formulated from a study of the properties of those foods prepared for animals by nature, are in perfect harmony with the definitions of Howell, Martin, Egbert, and Woodbury. It would seem that such a definition of food should be universally acceptable. But there are still some who contend that this definition is too exclusive, and that we must include among the foods all substances that are oxidized within the body.

W. O. Atwater, Professor of Chemistry in Wesleyan University, Connecticut, defines food: "That which, taken into the body, builds tissue or yields energy."

Atwater's definition of a food is in harmony with that of Liebig. This definition is accepted and defended by R. Mayer, by Binz, and by Landois. Note that this definition gives two distinct offices for foods: they build tissue or yield energy. It does not require of a food that it shall be assimilated by living cells, and become an integral part of cell protoplasm. It may be so used, or it may simply be oxidized somewhere between its ingestion and egestion, and thus yield energy to the body.

This naturally leads to a classification of foods into two classes: (1) Those that build tissue, called by Liebig the "plastic foods;" and (2) those that yield energy by their oxidation — Liebig's "respiratory foods." All of those substances which are oxidized in the body must yield energy in the form of heat. To determine, then, whether, according to this definition, a certain substance is a food, one has only to demonstrate that it is oxidized after its ingestion and before its egestion.

There is no other drug in the whole pharmacopeia about which there is so much disagreement of opinion as is the case with alcohol. There is no uniformity in the teaching regarding its influence upon the nervous system; some say it is a most valuable cardiac stimulant, while others contend that more exact observation shows its influence in this direction to be much overestimated.

Alcohol has been used as a drug longer than most drugs in the pharmacopeia. Its therapeutic use has grown up during the centuries before it became the rule to subject drugs to extended and searching tests before they were given any extended recognition. If alcohol had become a candidate for recognition years ago instead of centuries ago, it is safe to say that its application in medicine would have been very much more limited than we find it at the present time. Its wide therapeutic use is to be attributed in part to fallacies and misconceptions regarding its pharmacology, and in part to a disinclination on the part of the average practitioner of medicine to depart from old and well-beaten lines.

Before we can make any progress in the discussion of the subject, we must define terms.

What Is a Stimulant?—Gould defines a stimulant as, "An agent which excites the functions of an organ." Foster: "An agent that urges to increased action." The Century Dictionary: "An agent which temporarily quickens some functional or trophic process. It may act (1) directly on the tissue concerned; or

[1] Reprinted from the *Medical Review of Reviews.*

it may (2) excite the nerves which affect the process; or it may (3) paralyze the nerves which inhibit it."

What Is a Narcotic?—Gould defines a narcotic as, "A drug that produces the deadening of pain or produces complete or incomplete anesthesia." Foster classifies as narcotics "all substances which produce stupor." The Century Dictionary, quoting Quain's medical dictionary, gives the following definition: "A substance which directly induces sleep, allaying sensibility and blunting the senses; and which in large quantities produces narcosis or complete insensibility." Brunton: "A number of drugs tend to cause *unequal* disturbance of the function of the brain, and to those we give the name 'narcotic;' alcohol is the best example of this class of drugs." Bartholow: "Remedies which diminish or suspend the functions of the cerebrum, after a preliminary stage of excitement, are called narcotics or anesthetics. Their effects are expended chiefly on the nervous system. There is first a stimulation followed by stupor, and finally by coma." Cushny: "Narcotics are characterized by the production of depression of the central nervous system, more especially the cerebrum. From the large number of substances belonging to this division of organic chemistry which are possessed of narcotic powers, it would seem that the combination of carbon and hydrogen in the form characteristic of this series (open chain) is possessed of a special relation to the protoplasm of the nerve cells; they are possessed of specific depressant powers. . . . In the alcohol series, a regularly ascending scale of toxicity is met, commencing with methyl and passing through ethyl, propyl, etc.; each succeeding one is *more poisonous than its predecessor.*"

IS ALCOHOL A STIMULANT OR A NARCOTIC, OR BOTH?

Brunton, in his "Lectures on the Action of Medicines," would call it both. "Alcohol may increase the circulation through the brain, and thereby act as a real stimulant by dilating the vessels, but at the same time alcohol, although at first a stimulant, is chiefly a narcotic, *i. e.*, it lessens the activity of the brain cells themselves by its direct action on them, even while it may be stimulating them by quickening the circulation."

Recall Quain's definition of a stimulant It includes not only the agents which ac directly upon the tissue itself or upon the accelerator center, but also those substances which paralyze the inhibitory center. We must recognize a radical difference between these two methods of stimulation. The first is true stimulation and the latter pseudo-stimulation; or, to be more explicit, it should not be called stimulation at all, but what it really is, narcosis.

Cushny calls attention to the existence of "two distinct views as to the action of alcohol on the central nervous system; the one stoutly upheld by Binz and his pupils, that alcohol first stimulates and then depresses the nerve cells; the other championed by Schmiedeberg, Bunge, and their followers, that it depresses the central nervous system from the beginning."

Schmiedeberg explains the usually observed preliminary increased activity as "not due to true stimulation of the motor areas, but as the result of these areas' being freed from control by the weakening of the highest functions of the brain, the will, and self-restraint."

Cushny unreservedly accepts Schmiedeberg's interpretation of the facts, and adds, "Evidences of the depressing action of alcohol on the brain are embarrassing by their number."

Alcohol in small as well as large doses is a narcotic, whose typical action is preceded by a pseudo-stimulation.

THE ACTION OF ALCOHOL UPON THE NERVOUS SYSTEM.

This has just been referred to in a general way. It will be profitable here to cite the recent admirable paper of Riley, on "The Action of Alcohol on the Nervous System." The nerve cell-body possesses the typical cyto-reticulations in whose meshes are the chromophilic bodies. These bodies are replenished from the blood during rest, and used up by the cell; their latent chemical energy is transformed into active neural energy, during the waking activity of the brain. The fatigued nerve cell is smaller and more irregular in outline, and has a much reduced quantity of chromophilic bodies.

Experiments have been made upon the lower animals, particularly the rabbit, the dog, and the cat, to determine, if possible, the immediate effects of alcohol upon the

internal structure of the nerve cell. These experiments have been followed out somewhat as follows: An animal, such as the rabbit, has been fed a moderate amount of alcohol with its food, the amount given being sufficient to produce slight or moderate intoxication. The animals have been killed at different periods after eating the food containing alcohol, and the nerve cells of the central nervous system have been subjected to careful microscopical examination by the latest and most approved methods of study. Some animals have been killed a few minutes after the drug has been administered; others, in a few hours. In more than one instance, changes have been found in the nerve cells in less than an hour after the administration of the alcohol. A German investigator by the name of Dehio, and also Dr. C. C. Stewart, of Clark University, Mass., have brought out some interesting and convincing facts along this line. Dr. Stewart found distinct retrograde and pathological changes in the body of the nerve cells of the rabbit fifty minutes after the administration of a moderate quantity of alcohol. The same changes were also observed in a more marked degree in the case of other rabbits that were killed, and whose nerve cells were examined some fifty-four hours after the administration of the alcohol.

The same changes that have been observed in the nerve cells of those lower animals under the administration of alcohol have also been observed in the brain cells of man in cases where death has been produced by acute alcoholic poisoning.

The nature of the first changes found in both the rabbit and in other lower animals, and also in man from alcoholic intoxication, is a dissolving and scattering through the body of the cell of the chromophilic bodies previously described. The change is apparently the same whether alcohol is given to the lower animal, like the rabbit, for experimental purposes, or whether it is taken by man himself for the purpose of gratifying his perverted appetite. The opinion of all investigators is unanimous that alcohol causes a breaking-down and dissolution of the chromophilic bodies. The larger the quantity of alcohol taken, and the more severe the poisoning, the greater are the changes found in the nerve cell. If the poisoning is continued for any length of time, as it is in cases of chronic alcoholism, then the more solid structure of the nerve cell breaks down under its influence, and in some instances the cell is entirely destroyed and disappears.

We have briefly discussed the structural change wrought by alcohol upon the nervous system. There have been exact and exhaustive researches by Kræpelin, Aschaffenberg, Brunton, and many others, on the influence of alcohol upon the functions of the brain.

One citation will suffice: Brunton modified Francis Galton's instrument for measuring the speed of mental processes. As modified, it measured (1) the time required for simple reaction, *i. e.*, the time to indicate the seeing, hearing, and feeling of a signal, 0.18 sec.; (2) the time required for discrimination, *i. e.*, to indicate whether one sees a red or a white object, 0.24 sec.; (3) the time required for decision, *i. e.*, whether to press one button or another in response to varying signals, 0.36 sec.

Summing up the experimental work on this subject, Brunton says: "Alcohol increases the reaction time, the time for discrimination, and the time for decision. It makes all the nervous process slower, but at the same time it has the curious effect of producing a kind of mental anesthesia, so that all these processes seem to the person himself to be quicker than usual, instead of being as they really are much slower. Thus a man, while doing things much more slowly than before, is under the impression that he is doing things very much more quickly. What applies to these very simple processes, applies also to the higher processes of the mind. A celebrated author once told me that if he wrote under the influence of a small quantity of alcohol, he seemed to himself to write very fluently and to write very well; but when he came to examine what he had written, the next day, after the effects of the alcohol had passed off, he found it would not stand criticism."

Alcohol acts, then, as a specific poison to nerve cells, and the degree of the poisoning is in direct proportion to the quantity taken.

Victor Horsley, in a memorable address on "The Effect of Small Doses of Alcohol on the Brain," concluded, "From a scientific standpoint, the contention so often put before the public that small doses of alcohol, such as people take at

meals, had practically no deleterious effect, cannot be maintained."

THE INFLUENCE OF ALCOHOL UPON THE CIRCULATORY SYSTEM.

Exact researches demonstrate that small doses of alcohol do not modify the rate of strength of the heart beat. Large doses slightly weaken the strength of ventricular systole, and markedly weaken auricular systole. If, however, the subject increases muscular activity, as he is likely to do, the heart may be increased in rate of beat reflexly.

The arteries are dilated also by alcohol, but whether by paralysis of the vasoconstrictor centers or by a similar action on the muscles direct, is not known. Large doses cause fall of blood pressure.

INFLUENCE OF ALCOHOL ON DIGESTION.

The presence of alcohol in the mouth and in the stomach leads to an increase in the secretion of the saliva and gastric juice respectively. This is a practically uniform result, to which there are contributions by Wolff, Klemperer, Blumenan, Chittenden, and others. This increased secretion seems to be caused by the local irritating action of the alcohol upon the secreting cells direct, as well as by the greater vascularity of the glandular structures due to the vasodilatation which the alcohol causes.

There is much discordant testimony regarding the influence of alcohol upon the time required to digest a meal. The balance of opinion of the investigators is rather against than favorable to alcohol. Kretschy, Buchner, Bikfalvi, Ogata, and Blumenan have uniformly found a retardation; while Shelhass, Gluzinski, Henczinski, and Wolffhardt got results partly favorable and partly unfavorable to alcohol.

By far the most extensive and careful experiments in this field were performed by Chittenden, Mendel, and Jackson. Their tables show a fairly uniform retardation of the period of digestion, and Professor Chittenden concludes: —

"The time of digestion in the stomach for the proteid test-meal employed is not greatly varied under the influence of alcohol. The results obtained suggest, however, a tendency toward prolongation of the period during which the meat remains in the stomach when alcoholic fluids are present."

ALCOHOL AND BODY TEMPERATURE.

Professor Atwater follows Liebig of a half century past in placing alcohol among the heat-producing foods. We must all agree that alcohol is largely oxidized in the body to carbon dioxide and water. It yields just as much heat incident to its oxidation in the body as it would if oxidized outside of the body; so do morphine, the ptomains, and the toxins. But the case is stronger against alcohol and morphine than against the ptomains and toxins, because the narcotic action of alcohol on the cutaneous vasomotor system causes the temperature of the body to fall, notwithstanding the added heat from the oxidation of the alcohol. When given in doses that produce the flushing of the cheeks, — very moderate doses, by the way, — there will always be a fall in body temperature, slight or marked, commensurate with the dose. This effect is produced through combined action of alcohol upon the heat-generating factor as well as upon the heat-dissipating factor of the body temperature.

As above stated, alcohol lessens cell activity, and thus lessens the generation of heat by the active tissues. Von Bunge says: —

"Even if alcohol does on the one hand increase the heat formation through its own oxidation, it on the other hand increases the heat radiation. Through the paralyzing action which it exerts upon the vasomotor centers, there occurs a dilatation of the vessels, especially those of the skin, and this leads to increased loss of heat. The total result is, in any case, a lowering of the body temperature, which has been conclusively demonstrated."

Landois mentions the danger of taking alcohol or morphine when the body is to be subjected to extreme cold. All northern explorers know that the use of alcohol endangers life through the cooling of the body.

Brunton tells a well-authenticated incident in this connection: "A party of engineers were surveying in the Sierra Nevada. They camped a great height above the sea level, where the air was very cold, and they were chilled and uncomfortable. Some of them drank a little whisky, and felt less uncomfortable; some of them drank a lot of whisky, and went to bed feeling very jolly and comfortable indeed.

But in the morning the men who had not taken any whisky got up in good condition; those who had taken a little whisky got up feeling very miserable; the men who had taken a lot of whisky did not get up at all; they were simply frozen to death. They had warmed the surface of their bodies at the expense of their internal organs."

ALCOHOL AND MUSCULAR WORK.

It has been so frequently demonstrated that alcohol in even moderate doses impairs the muscular action both in power and agility, that all athletes abstain totally from it during training as well as during the contests. Prize fighters, though plying their trade especially in the interest of the drinking and gambling element of society, are not allowed an ounce of whisky or brandy for weeks before a contest.

Several European governments have made comparative tests of sugar and alcoholic drinks for soldiers on forced marches. These tests have invariably resulted in alcoholic drinks' being withheld during all strenuous work, sugar or sweet chocolate being given with the rations for such occasions.

Leitenstorfer's extensive experiments on sugar and alcohol resulted in a recommendation to the commissariat of the German army, later adopted in the main, that sugar be used, (1) as a supplementary article to improve the daily rations of the soldier; (2) as a reserve supply in ships; (3) as a temporary ration to strengthen the soldiers and sustain their vigor while on the march.

The *Revue Scientifique*, in commenting upon the experiments of Leitenstorfer, says: "Sugar appears to be indicated to replace alcohol or wine under the various conditions when it has been commonly considered desirable to include the latter in rations. Sugar affords stimulation, but without any danger. It has, moreover, the incontestable advantage of being a muscular aliment of the first rank, combating and at the same time preventing fatigue."

Bunge says of these army experiments: "Better than through all the laboratory experiments and deductions is the demonstration of the complete uselessness, indeed harmfulness, of even the most moderate doses of alcohol, which demonstration has been made through the thousandfold experiments by the commissariat of the army, and which have already established conclusively that soldiers in times of peace and in times of war, in all climates, in heat, in cold and rain, endure best all the fatiguing exertions of the most exhausting marches and maneuvers when they are absolutely deprived of all alcoholic drinks."

THE RELATION OF ETHYL ALCOHOL TO THERAPEUTICS.

The fallacies which exist arise from a misunderstanding of the pharmacology. Alcohol dulls the sense of pain or discomfort, so the physician administers it frequently and freely, and receives the uniform answer, "I feel much relieved, Doctor." So the physician allows himself to feel complacent over his apparent success. In this case the physician is alcoholized as well as the patient; for, in a vast majority of cases, he has caused only a slight temporary relief, and has not struck at the root of the matter at all.

We can establish rational therapeutics only upon a scientific and thorough pathology and pharmacology.

It is necessary to give alcohol when the pharmacological findings concerning that drug prove it to be better adapted than any other to meet the pathological conditions.

It is admissible to use alcohol when we find it to be as well adapted as any other for a particular case.

This agent is much used in fevers, especially those of the continued asthenic and septic types. The wisdom or unwisdom of this practice can be conclusively demonstrated only through extensive and comparative clinical studies, preferably in a public hospital, where all facilities would be offered for detailed examination, and where the patients treated with alcohol, and those without, would be under the observation of several skilled observers.

PROFESSOR DEBAUL, of Paris (*Quarterly Journal of Inebriety*), declares that the inability of the French women to properly nurse their children depends in a large measure on the use of alcohol. This diminishes the secretion of milk and produces degeneracy, both in the mother and the offspring. — *Cincinnati Lancet Clinic.*

ANGIONEUROTIC EDEMA.

BY DAVID PAULSON, M. D.,
Superintendent of the Chicago Branch of the Battle Creek Sanitarium.

THE pathology of this obscure disease has been variously regarded by different writers. The consensus of opinion is in favor of considering it a vasomotor neurosis. In some respects, it is not altogether unlike urticaria, but with this exception, that it is likely to be more localized, and the enormous size which the vesicles or welts may attain is out of all proportion to what is seen in urticaria. Undoubtedly in many instances it requires a combination of various causes to produce this distressing disorder, but there can be no doubt that in the majority of cases there is underlying it a gastro-intestinal disturbance resulting in autotoxemia, and a general irritation of the sympathetic nervous system.

Five years ago Mr. —— came to the Battle Creek Sanitarium after having suffered with this disorder for several years. The attacks had gradually increased in number and severity until at the time he placed himself under our care, there was an interval of only a few days between them. The edema would usually appear quite suddenly, that is, it would require only a few hours from the first indication of an attack until it had reached its height. It would remain stationary for several hours, then gradually recede, the entire disturbance ordinarily lasting ess than a day. The favorite locality for their appearance was the chest, neck, face, mucous membrane of the mouth, and undoubtedly, from the severe gastric disturbance that frequently accompanied them, also the mucous membrane of the stomach. Occasionally the larynx would be so affected that the patient was seriously threatened with asphyxia. The accompanying photograph of the patient was taken when the most marked swelling was localized in the upper lip. It fails to bring out fully the enormous thickness that it had attained in a few hours. The extreme tension of the skin occasioned severe pain.

The patient had been unable to receive anything but the slightest temporary relief. He had noted that certain indiscretions in diet would precipitate an attack. He was immediately placed upon an aseptic dietary, meats of all kinds and such irritating substances as condiments and spices being excluded. Care was taken that all starchy food was thoroughly dextrinized, and he was advised to use a liberal quantity of fruits, so as to take advantage of their well-known power to inhibit bacterial activity in the stomach. A careful line of graduated tonic hydriatic treatment was prescribed, combined with suitable applications of electricity, daily massage, and properly regulated physical exercises in the gymnasium.

In less than two weeks a noticeable improvement had taken place; in less than a month the patient was compelled to discontinue treatment on account of business complications at home, but a home prescription was prepared, embodying, as far as his facility for carrying them out would permit, the same principles as had been utilized in his treatment while at the Sanitarium.

The patient was seen six months later, and had had only one or two attacks during that interval, and these came on during a journey, when he was compelled to deviate from the natural and wholesome dietary which he had adopted.

A report from the patient four years later was to the effect that he was industriously cultivating his general health, and that he had been entirely free from any recurrence of the attacks, with the exception of a slight suggestion of them several times when he had indulged in some marked dietetic indiscretion.

HYDRIATIC SUBSTITUTES FOR ALCOHOL.[1]

BY J. H. KELLOGG, M. D.,

Superintendent of the Battle Creek (Mich.) Sanitarium.

THE question of the use of alcohol in connection with the cold bath when used for the reduction of fever and as a cardiac stimulant, is one deserving of most careful thought and attention. The idea upon which this practice is based, is evidently the supposition that alcohol is a stimulant, at least that it in some way sustains the heart or the vital powers. But this theory was long ago rendered thoroughly untenable by a multitude of carefully conducted experiments upon healthy subjects, showing that alcohol is always, and in all doses, a narcotic, and not a stimulant; that it depresses, and does not excite the heart and other vital organs; that it lessens vital resistance to disease; and that it is a toxic agent which the body must cast out, not a food to be assimilated, nor a source of energy or aid to any vital organ or function.

The relation of alcohol to the heart and the circulation is a matter of great importance in the class of cases in which the cold bath is most frequently applied. In relation to this point the fact should be recalled that the heart is not the only force involved in the circulation of the blood. It is doubtless the great engine of the circulation, but it has been clearly shown by Schiff and numerous other physiologists that the movement of the blood is greatly aided by a rhythmic action of the small vessels, both arterioles and capillaries. These contractions are not simultaneous with those of the heart, hence do not interfere with its action; but as the pressure in the veins is much lower than that of the arteries, these contractile movements serve most efficiently in pushing the blood along toward the veins. The heart keeps the large arteries pumped full of blood, while by means of the contractile movements of the peripheral vessels, the blood is, so to speak, milked out into the veins. We may say, in fact, that there are two hearts concerned in the circulation, the work of the central organ being supplemented by the peripheral heart,— the small vessels,— working at the distal end of the vascular loop, where the resistance is greatest.

Active congestion, or hyperemia, is simply a state in which the movements of the small vessels are very vigorous, and have a wide swing, so that a large amount of blood is passed through the tissues. In passive congestion there is dilatation of the small vessels without increased activity. One condition results from increased action of the vessels through stimulation of both the vasodilators and the vasoconstrictors; the other from paralysis of the vasoconstrictors or excitation of the vasodilators, or both, resulting in dilatation of the small vessels with stagnation of their contents. In active congestion, the aid afforded by the rhythmic movements of the small vessels is increased. In passive congestion this action is greatly diminished or entirely lost. The difference in the rate of movement of the blood gives rise to the difference in color, — scarlet in active hyperemia or congestion, cherry red in passive congestion. In the one case a rich supply of fresh oxygenated arterial blood is passing through the small vessels into the veins, the movement of the blood is rapid, and all the vital processes are quickened; the heart, as well as all other organs, is thus better nourished and energized.

In passive congestion and all conditions of the circulation in which a cyanotic appearance is present, the usual condition is slowed circulation. The blood current is slow through cardiac weakness, or lack of the active assistance of the peripheral heart; as a consequence, an insufficient amount of oxygen is introduced into the body, the blood is charged with CO_2 and other tissue poisons, and all the vital processes are depressed. To aid the heart and the circulation, the thing needed is not simply an increased rate of activity of the heart, or an increased volume of the pulse, but an increased movement of the blood current throughout the entire system.

Pallor is due to contraction of all the vessels of the skin; local cyanosis is due to greatly slowed movements of the blood, either from passive congestion or spasm of the arterioles, resulting in the excessive absorption of oxygen, and the accumulation of CO_2 in the blood.

In the application of any agent for the purpose of relieving conditions of this kind, the peripheral heart, as well as the

[1] Read by title before the American Medical Temperance Association held at St. Paul, Minn., June 4-7, 1901.

heart itself, must be taken into consideration. In fact, the whole circulatory system must be regarded as one. The heart and the arteries are composed of essentially the same kind of tissue, and have practically the same functions. The arteries and capillaries, as well as the heart, are capable of contracting. Both the heart and the arteries are controlled by excitory and inhibitory nerves. These two classes of nerves, controlling the heart and the vessels respectively, are kindred in structure and origin, the vagus and the vasodilators being medullated and of spinal origin, while the accelerators of the heart and the vasoconstrictors of the arteries are non-medullated.

Winternitz and other authorities have called attention to the value of cold as a cardiac stimulant or tonic. The tonic effect of this agent is greater than that of any medicinal agent which can be administered.

The cold compress applied over the cardiac area of the chest may well replace alcohol as a heart tonic. The application consists of a compress applied to the portion of the chest wall over the heart. This comprises the space bounded by the second rib above the right border of the sternum, a line falling one-half inch to the right of the nipple, and the sixth rib. The compress should be large enough to cover this space, and to extend at least two inches outside of it. Ordinarily the best effects are produced by employing water at a temperature of about 60°. The compress should be wrung moderately dry, and should be very lightly covered. It is desirable that cooling evaporation should be encouraged, and should be continued for some time.

The thing necessary to encourage the heart's action is not mere relaxation of the peripheral vessels, but, as Winternitz has shown, increased activity of the peripheral circulation in the skin, muscles, and elsewhere. Alcohol paralyzes the vasoconstrictors, and so dilates the small vessels, and lessens the resistance to the heart action; but at the same time it lessens the energy of the nerve centers which control the heart, diminishes the power of the heart muscles, and lessens that rhythmical activity of the small vessels whereby the circulation is so efficiently aided at that portion of the blood circuit most remote from the heart. A cold application to that portion of the chest overlying the heart reflexly stimulates and energizes the heart through the cardiac nerves. This reflex action is not confined to the heart muscle; the stimulation of the activity of the cardiac vessels improves the circulation through the heart structure, refreshing and energizing it in the same manner in which a voluntary muscle is energized by a cold application, as is so well shown by the ergograph.

It is well to remember that vasoconstrictor nerves are one in kind with the excitor nerves of the heart, while the vasodilators are in like manner associated with the vagus. With this in mind, it is easy to see that while alcohol paralyses the vasoconstrictors, it at the same time weakens the nerves and the ganglia which initiate and maintain the activity of the heart. Cold, on the other hand, excites to activity these nerves and centers, and thus produces the opposite effect.

The apparent increase of strength which follows the giving of alcohol in cases of cardiac weakness is delusive. There is increased volume of the pulse for the reason that the small arteries and capillaries are dilated, thus lessening resistance and cardiac work; but this apparent improvement is very evanescent, as naturally results from the fact that while the heart is relieved momentarily by the sudden dilation of the peripheral vessels, the accumulation of blood in the venous system through the loss of the normal activity of the peripheral heart, gradually raises the resistance again by increasing the load of blood which has to be pushed along in the venous system. This loss of the action of the peripheral heart thus in the end more than counterbalances the temporary relief secured by the paralysis of the vasoconstrictors. This accumulation and sluggish movement of blood in the venous system is shown by the purplish hue of the skin in a person under the influence of alcohol, — a wide contrast to the ruddy glow presented by the skin in which the small vessels are actively engaged in pumping the blood out of the small arteries into the veins, an operation in which the whole body may be made to participate by a general cold douch or other suitable application of cold water to the surface. Cold applications, general and local, may be safely affirmed to be the true physiological heart tonic.

In Germany and France it is the al-

most universal custom to administer alcohol to the patient just before putting him in the cold bath. Some practitioners, as Winternitz, administer but a very small amount, a single mouthful of wine for instance; while others give brandy in considerable quantities. A few American practitioners also employ brandy freely with the cold bath. The unwisdom of this practice will be apparent on due consideration of the following facts: —

1. One purpose in administering the cold bath is to secure a true stimulant or tonic effect by arousing the vital energies, especially through excitation of the nerve centers of the vasomotor, sympathetic, and cerebrospinal systems. Alcohol was once supposed to be capable of effecting this, and was used for this purpose in typhoid fever and various other morbid conditions accompanied by depression of the vital forces. At the present time, however, it is well known, and with practical unanimity admitted, that alcohol is neither a tonic nor a stimulant, but a narcotic; that it depresses, and does not excite; that it lessens and does not increase the activity of the nerve centers; and this is true of small as well as large doses, as has been shown by the researches of careful investigators. In evidence of the foregoing may be cited the following statements from medical men recognized as authorities throughout the civilized world: —

Harnack says: "It should also never be forgotten, that, even in small doses, the paralyzing action of alcohol is exercised most rapidly and energetically upon the tonus of the blood vessels, the importance of which tonus for the regularity of the circulation and the cardiac energy, is well known."

Victor Horsely, an eminent English surgeon, speaks thus respecting the influence of alcohol upon the heart: "Surgeons of former days used alcohol extensively to combat shock, but the old theories of shock have been proved erroneous, and alcohol has consequently become unnecessary. It will be less and less used in the future, and the discredit into which it has fallen is justified."

Hermann Frye, by the use of Mosso's ergograph, showed that "in the unfatigued muscle, alcohol lessens the extent of its maximum contraction, owing to a lessening of the peripheral irritability of the nervous system."

The heart is a muscle, and consequently alcohol cannot be expected to increase its working power; and when laboring under the influence of toxic agents, as in febrile state, it is clearly evident that the effect of this agent must be distinctly and altogether pernicious.

Chantemesse calls attention to the diminished toxicity of the urine in many cases of typhoid fever, the toxins being retained in the body during the fever, resulting in an enormous increase of the toxicity of the urine during convalescence. This fact is of great importance in connection with the use of antipyrine and alcohol, which lessens the activity of the kidneys, and so causes still further retention of the toxins.

In a series of physiological experiments conducted by the writer in 1893, and reported at the meeting of the American Medical Temperance Association held at Milwaukee in May, 1893, it was clearly shown that nervous, muscular, and glandular activities are all diminished to a noticeable degree by the ordinary medicinal doses of brandy and other stimulants.

It is clear, then, that those who administer alcohol before the cold bath, antagonize the therapeutic activity of the measure, since as far as alcohol has any effect whatever, it is to depreciate or neutralize the very effect which the cold application is designed to secure.

(To be continued.)

Mental Depression Cured by Hydrotherapy.— Murphy (*Intercolonial Med. Jour.*, Feb. 20, 1901) reports two cases of mental depression cured by hydrotherapy. Both were severe, with great mental depression, insomnia, delusions, anemia, loss of flesh and weakness. Both patients became dirty in their habits; would not dress themselves, take their food, or even move about. Dr. Beattie Smith's plan of hydrotherapy was adopted in both cases. Each morning the patient was stood in a tub of warm water, temperature 100° F., and a cold douche of some force applied to the spine for about a minute; then he was taken out and well rubbed until he was warm. This was followed by a short walk, and afterwards by rest.— *International Medical Magazine, August, 1901.*

TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

HOW TO MAKE AN AUTOPSY.

DR. C. W. CANAN, in an article which appears in the July 26th number of the *Virginia Medical Semi-Monthly*, calls attention to the fact that the general practitioner of medicine lacks training and knowledge in performing post-mortem examinations. He also calls attention to the great value derived from the experience obtained from such examinations, and gives the following direction for performing an autopsy: —

"When a post-mortem is held with reference to various medico-legal points, as in case of murder or suicide, it should begin by a thorough inspection of the outer part of the body. When the examination is made some time after death, it becomes quite difficult to differentiate between injuries and post-mortem changes in the skin. The physician should be very careful and reserved in his remarks, as large interests, as in accident and life insurance, may depend upon the proper interpretation of such small points. The external examination finished, the abdomen should be opened so as not to interfere with the normal relation of the different organs. Carefully inspect these, but do not sever any connections; then open the thorax and note the relations there. This done, sever the trachea, insert the finger into it by which traction can be made, and with a few careful strokes of the knife remove the lungs and heart together. These can now be carefully examined. By a stroke of the knife along the left and right border of the heart, its chambers will be brought into view.

"In obscure cases, where death resulted from asphyxia or paralysis, the right and left ventricles will be respectively over filled. Clearing the heart of all attachments, except an inch or two of the aorta and pulmonary artery, by which the organ can be suspended, water should be allowed to flow into these to test the integrity of the valves. If the water disappears slowly from the cavities, it is due to the filling up of the coronary arteries. It is a very difficult thing to properly interpret valvular disorders. We have seen grave lesions and no insufficiency. This may exist in the heart muscle and not be recognized at the autopsy. Keep these things before you, and you will seldom coincide with the 'meaningless diagnosis of heart failure.'

"In opening up the valves, draw aside the pulmonary artery, or it will be divided by cutting out from left ventricle through the aorta. This should always be done with a sharp pair of scissors. Leaving the thorax, the omentum and spleen should next be examined; while some prefer to examine the stomach and duodenum, these should be opened in situ by one incision. Following this, the liver, pancreas, and mesentery can be inspected. For the sake of cleanliness, the intestines should be left for the last. The urinary organs should be examined consecutively, first, the kidneys; second, the ureters and bladder; and third, the genitals. The kidneys should be divided from their convex border through the pelvis, so that we have a comparative view of their structures.

"There are two methods for removing the skullcap so as to expose the brain. The first is the circular method of sawing off the calvarium. The second, which is to be preferred in private practice and is quicker, consists in cutting out an elliptical piece from the vortex, beginning at the ears and going with the saw anteriorly and posteriorly until the fontanelles are reached. This does not disturb the tissues of the face.

"The brain substances can be best examined by one of two methods: the first is to open the lateral ventricles, and then by making concentric long incisions, lay open the brain like the leaves of a book. The second method is to make horizontal sections with a broad knife from convexity to base. I prefer the second method, because it so admirably exposes the region of the internal capsule, where minute hemorrhages are so liable to occur, but the operator will use his good judgment as to which method will best help him to ascertain any special pathological condition he may be looking for, and at the same time be able to see all others that may be present. Any method that minutely subdivides the brain and brings every part of its structure into view, is the one to be followed, for the reason that a very small lesion, sufficient to cause profound disturbance, or even death, might otherwise be readily overlooked.

"In holding autopsies in private practice, you cannot go into it so thoroughly because of lack of time and surroundings, but it should be done as thoroughly as possible, so as to derive all the benefits you can. A good clinical history will aid you very materially in interpreting your pathological findings. Some may think this a reflection on the resources of pathology, but it is not, for many diseases may run a fatal course and leave no clue as to their existence except what has been gathered in the clinical history. Many able pathologists, after holding a post-mortem, have been at a loss to account for death, when the clinical history was brought forward and cleared up the case. These are the exceptions, for in most instances the knowledge gained from the autopsy confirms the diagnosis or clears up those that were in doubt.

"The thorough understanding of pathology is indispensable to the physician, for he who understands disease the best will treat it the best. Therefore, he who is skilled in pathology and is competent to make pathological examinations and rightly interpret them, has attained one of the aims of progressive medicine."

SURGICAL HINTS.

THE ether or chloride of ethyl spray will sometimes prove quite useful in stopping severe bleeding from cancerous or other ulcerations in which the hemorrhage is rather of an interstitial than an arterial character.

Never give an emetic in order to recover a foreign body that has passed into the stomach. If it is small enough, it will always be passed in the course of a few days; while if too large for this, vomiting would be a dangerous and useless thing to bring about.

An attack of hysteria simulating unconsciousness in a woman may be aborted by the surgeon's taking a pair of scissors and regretfully announcing that he will have to cut all the patient's hair off in order to make application to her head. It is doubtful whether this bluff has ever been known to fail.

When feeling for fluctuation in any part of the body that is covered by heavy muscular structures, place the hands along the long axis of the muscular fibers and never across them. The latter position would certainly deceive the observer into thinking that fluctuation is present, as may be easily seen in the case of the large anterior muscles of the thigh.

In furuncles and carbuncles of the upper lip it is especially important to operate promptly, usually by thorough excision under an anesthetic. The location of the disease, in such cases, makes it peculiarly dangerous, owing to the possibility of the occurrence of rapid thrombosis of the facial veins, extending to the cerebral sinuses. This, in turn, is apt to cause fatal pyemia.

In every case of coma, whether from alcohol or any other cause, always investigate the bladder by percussion, in order to find out whether there is a retention of urine. Should this be the case, measures must at once be taken to empty the bladder. If coma is due to nephritic troubles, it must not be forgotten that the fact that no urine has been passed for a long time may be due to suppression instead of retention.

In accident cases, however slight, to which the surgeon is summoned, and in all minor operations, it must always be remembered that there is a possibility which must be provided for, that the patient may faint. Men must be even more closely watched than women, for in the latter the process is nearly always more gradual. Men usually faint suddenly as if they had been shot, while women generally give some warning, and will often be able to reach a chair or some other position of safety before the syncope occurs.—*International Journal of Surgery, July, 1901.*

Hydrotherapy.— The stimulating effect of water is elaborated upon by Baruch (*Brooklyn Medical Journal*), whose confidence in this agent has been gained after years of study and observation. The first diseases in which he mentions its use especially, are phthisis and neurasthenia. In the former the use of douches and systematic hydrotherapeutic treatment often seem to be very effective. In neurasthenia, he believes that the methodical employment of hydrotherapy in combination with proper diet and environment, will work wonders in many cases.

The most useful procedures are the dry pack, which consists in the snug wrap-

ping of the patient in heavy woolen blankets for about an hour, followed by uncovering of successive parts of the trunk, then treating to a rapid and brisk rubbing with a bath glove or washrag squeezed out of water at 85° F. After drying and friction, the patient is sent into the air for general exercise. The process is repeated daily, the water temperature being reduced two or more degrees each day, until 60° F. is reached.

When the patient bears this well, he is subjected to more decided measures. Standing in water at 100° F., in a warm bathroom, the patient may be subjected to effusions from a foot-tub containing water at a temperature of 80° F., daily reducing it two or three degrees, until a temperature of 60° F. is reached. Water is dipped and thrown with force on the back and shoulders with a long-handled basin or large tin dipper. If this is done forcibly, followed by rapid drying and dressing and exercise, the patient will not be chilled. Every day larger quantities of water may be used, always avoiding chattering of the teeth and cyanosis. He thinks this method can be applied at home, and that the stimulant arouses the depreciated neurons, increases the vascular activity of the brain, and improves the general and local nutrition. Those cases of neurasthenia in which insomnia is prominent are specially amenable to hydrotherapy judiciously added to treatment of the general condition.

Diabetes is another disease in which he finds hydrotherapy of decided benefit. He has frequently observed that strict dietetic rules may be relaxed if systematic exercise is added to the treatment of diabetes. Nervous dyspepsia, hysteria, obstinate neuralgia, sciatica, neuritis, lumbago, and allied diseases are relieved by cold applications. Spasmodic and bronchial asthma which has resisted other treatment, is remarkably relieved under hydrotherapy; and we are aware of what has been done in the Nauheim method of treatment of cardiac disease. Angina pectoris, which is more often of the false than the true type, hydrotherapy has often relieved after failure of other methods employed by his colleagues and himself. In gouty rheumatism and lithemic disease, remarkable cures are effected by the judicious application of baths and douches under the direction of a skillful physician in watering places. Their treatment may be imitated at home, wherever douches under pressure of twenty to thirty pounds can be had. This treatment stimulates the emunctories, especially when combined with abundant and methodical drinking of water. He has observed great relief in this type of patients, and often complete restoration is obtained under the hot bath and douche and massage treatment at home.

His deductions are from an experience of more than 100,000 recorded procedures in neurasthenia, hysteria, some of the psychoses, phthisis, gout, rheumatism, dyspepsia, cardiac diseases, sciatica and other neuralgias, obesity, and neuritis. He cautions, however, against empirical application of treatment, or its use in unskilled hands. If water is to be a valuable remedy, it must be only in the hands of the medical man; its theory and practice must be taught in our schools and its application in our hospitals.—*Jour. of the Am. Med. Asso., Aug. 3, 1901.*

Pernicious Anemia.— Concerning this subject, Hunter, in the *Interstate Medical Journal*, has recently studied seven cases of pernicious anemia, and draws the following conclusions from his observations: —

"1. Pernicious anemia is a special form of chronic blood-poisoning, a toxemia.

"2. It is the result of a special infection of the digestive tract, especially of the mouth and stomach, and probably, although to a less degree, of the intestines.

"3. The chief source of infection is through the mouth, from long-continued and neglected cario-necrotic conditions of the teeth, and sometimes possibly from stomatitis arising from other causes.

"4. The usual effect of this infection is a chronic infective catarrh of the mouth and stomach, which may in time lead to deeper-seated changes; viz., ulcers of the mouth and tongue, and chronic gastritis with atrophy of the gastric glands.

"5. Evidences of the infectivity of the organisms of dental decay are overwhelming, and in suitable cases the infective nature of the resulting catarrh of the stomach can also be demonstrated.

"6. Infection is chiefly streptococcal, and possibly derives its special characters from being of a mixed character.

"7. Such infection the more readily occurs if the stomach or intestines be already, from any cause, the seat of disease.

"8. The gastric and intestinal irritation (sickness, retching, vomiting, looseness of the bowels, and diarrhea) so often noticed, and which I find to be even more common than is stated (being recorded in close on to eighty per cent of cases), is the local effect of this infective catarrh; while the excessive destruction of blood taking place in the portal area, is the result of the action of the poisons in the blood.

"9. The fever so commonly met with is not an accidental occurrence, the effect of weakness, but is a feature of the infective process itself, and its variations correspond to the variations in the activity of that process.

"10. Such variations are common from week to week, sometimes from day to day, in the progress of the disease, even when it is running a fairly progressive course.

"11. In addition, however, the course of the disease toward the fatal termination is often marked by one, sometimes two, periods of marked improvement, lasting, it may be, many months, or a year or more, followed by relapses. This character of the disease I have come to regard as the result of a relative immunity, unfortunately only temporary in its nature, conferred by the disease itself, to an immunity accelerated and greatly strengthened for a time by a suitable medicinal treatment, notably by the administration of arsenic.

"12. The above conclusions suggest certain new considerations in regard to treatment, of which the chief are: (1) Minute attention to the hygiene of the mouth, and especially of the teeth, with the immediate removal of every source of infection there; (2) stricter antiseptic treatment of the stomach and intestines; and (3) antitoxic serum treatment, with the view of antagonizing within the blood itself the poisons absorbed into it."— *Charlotte Med. Jour., July, 1901.*

Diagnosis of Cancer of the Womb. — F. J. McCann (*British Medical Journal*, July 13, 1901) enumerates the following:—

1. Hemorrhage. The bleeding may at first be small, occurring only after sexual intercourse. It may be evidenced by an increased menstrual flow, becoming a sanious, watery discharge.

2. Fetid discharge. This indicates sloughing and infection. A growth may attain considerable proportions without this secondary infection.

3. Pain is a late symptom, and indicates that the disease has extended to the pelvic peritoneum and cellular tissues, and that it is too advanced for eradication.

4. Wasting and cancerous cachexia are the result of pain and absorption of septic material.

5. Later signs and symptoms are bladder troubles, fistulæ, blocking of the ureters (causing hydronephrosis and uremia), pressure on the iliac veins causing thrombosis and edema.

Cancer of the cervix uteri is to be distinguished from —

1. Cervical erosions, especially the cockscomb-like erosion which hangs from the cervix and bleeds easily. An early cancerous growth has a sharp, prominent, clearly raised, and somewhat infiltrated margin; the base is irregularly nodulated; it is raised above the surface, and is yellowish-pink in color. The erosion is bright red, tears very readily, and has no hard or infiltrated edge.

2. Mucous polypi with ulceration and sloughing. The discovery of the stock, or pedicle, will settle the diagnosis.

3. Chronic endocervicitis, with plugged follicles (Nabothian ovules), causing hardness of the cervix and irregularity of its contour. Puncture of the follicles with a knife will allow the escape of a glairy fluid.

4. Fibromyomatous polypus with sloughing of the surface. Local examination will show that the surrounding neck of the womb is healthy.

6. Fungous endometritis (uterine adenoids) when the hypertrophied nodules project through the os. Examine the uterine cavity, and make microscopic sections of the growth.

Cancer of the body of the uterus may be confounded with —

1. Pregnancy in the earlier months associated with hemorrhage and discharge. History and physical signs will exclude malignant disease.

2. Intrauterine tumors (polypi). The amount of hemorrhage is usually greater than in cancer. Exploratory dilatation and examination with the finger will determine.

3. Fungous endometritis. Examine scrapings under the microscope.

4. Senile endometritis, of which cancer may be a sequela. There is little or no pain, more or less purulent discharge, at times bloody, never contains pieces of growth, uterus not much enlarged.

5. Myoma. Examine section microscopically. — *St. Louis Medical Review, August, 1901.*

The Limitation of Drug Therapy. — Medicine is justly styled the healing art, and therefore if we would become healers of the sick as well as diagnosticians, we must endeavor to make a practical application in therapeutics, of the truths taught us by pathology, bacteriology, physiological chemistry, etc. We have passed beyond the time when practitioners of medicine are mere "pill peddlers." The time has come when the prescriptions are limited and medicines rare. The time has come when water, sunshine, and good air are recognized as valuable therapeutic agents, in fact the most valuable. A patient in ill health is told to seek a climate that will be conducive to the restoration of his health, instead of loading him down with prescriptions. Robt. H. Babcock, concluding an able article along this line in the *New York Medical Journal*, says: —

"We Americans are too prone to regard the state of the weather, as if rain, wind, and sunshine could be hurtful to him who is properly prepared to encounter them. Let us not as an association, however, devote our energies too exclusively to the climatology of consumption, ignoring the other natural means of cure in the treatment of diseased conditions in general. Let us broadly preach the gospel that good health means the intelligent daily use of those agencies with which bountiful Nature has supplied us, and which, alas! but too few physicians, as well as patients, know how to employ intelligently. By instructing the people how to make proper use of fresh air, exercise, healthful food, and water, we shall not only furnish them with what is better than prescriptions, but we shall guard them against many of those ills to which they now succumb, and thereby rid ourselves of the opprobrium of being mere 'medicine men.'" — *The Charlotte Medical Journal, August, 1901.*

Danger from Alum in Food. — A bill having been presented in the New York Legislature, similar to the one now in effect in Missouri, prohibiting the manufacture of baking-powder containing alum, the opinion of a number of leading physicians was obtained concerning the statement of the "alum people," that while alum itself in food would be harmful, it is practically dissipated during the process of baking. All the authorities consulted (among them Victor C. Vaughan, Professor of Hygiene in the University of Michigan, at Ann Arbor; Professor Russell H. Chittenden, of Yale University; Professor John W. Mallet, of the University of Virginia; G. M. Sternberg, Surgeon-General of the United States Army, and other leading physicians, chemists, and hygienists, who recently testified upon this subject before the Committee on Manufacturers of the United States Senate) agreed that alum baking-powders are injurious.

Doctors everywhere should demand that efficient laws for the suppression of this evil be passed, and that they be stringently enforced. It is to be hoped that the various State Legislatures will put upon the statute books effective laws to this end. — *American Surgery and Gynecology, July.*

The Fat-Splitting Enzyme of the Stomach. — One of the most interesting of the recent discoveries in physiological chemistry is the detection by P. Volhard, of a fat-splitting ferment in the gastric juices. Volhard (*Zeit. für klin. Med.*) states that if an emulsified fat, such as the yolk of an egg or milk, be mixed with gastric juice, and the mixture kept at body temperature for about an hour, the emulsion will be broken up, and the fatty acids will be seen floating on the surface of the fluid. Artificial emulsions and non-emulsified fats are only slightly affected; a glycerine extract of the stomach has a similar action to the gastric juice, and, like pepsin, the steatolytic ferment appears to be secreted principally by the mucous membrane of the fundus of the stomach. Boiling of the gastric juices or glycerine extract destroys the action of the ferment. The presence of hydrochloric acid and pepsin has also a deterrent influence on the activity of the enzyme. — *Dominion Medical Monthly, July, 1901.*

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

The Bacteriology of Ozena.—F. Perez (*Ann. de l' Inst. Pasteur*, May 25, 1901) has made further bacteriological examinations of ozenic discharges since he first described the so-called "cocco-bacillus fetidus," in 1899, and is now convinced that this organism is the only exciting cause of ozena.

Liguier, while studying the hemorrhagic septicemia known as "pasteur-ellosis," found the cocco-bacillus in a pneumonic patch of a dog which had been inoculated with a culture of canine pasteurella. Although minute precautions had been taken to disinfect everything used in the experiment, the presence of the cocco-bacillus was attributed to accidental contamination. But some time later the same experimenter found the organism under similar circumstances; and Perez was led to examine the bacterial flora of the nose and saliva of various animals. The cocco-bacillus was found in one out of six dogs examined, but not in the case of other animals; for example, cats, pigs, and sheep.

It may be concluded, then, that dogs may transmit ozena. Some confirmation was obtained from clinical history: Nine patients out of forty-one gave striking stories of unusual contact with dogs, due in some cases to business, in others to inclination. It is probable that the cocco-bacillus is a normal occupant of the dog's nasal secretion, but that an attack of pasteur-ellosis is necessary to cause it to become virulent.—*British Medical Journal, July 20, 1901.*

Variability in the Agglutinative Property of the Typhoid Bacillus.—The researches of Sacquépée (*Ann. de l' Inst. Pasteur*, April 25, 1901) have led him to the conclusion that the agglutinative property of the bacillus of Eberth is variable. The variations toward a low degree are the most important. Bacilli corresponding exactly to the typical B. typhosus are found in nature, rarely in water, occasionally in typhoid stools, which are only slightly or not at all agglutinated by typhoid serum. If kept in closed tubes, they transform themselves spontaneously into bacilli, giving the agglutinative reaction typically. A normal type of the bacillus, on the other hand, if kept for a long time in immunized animals, loses by degrees its agglutinative property; this resistance to agglutination, is, therefore, an acquired property, and a given specimen of the organism may possess it to a greater or less degree according as it is obtained from a source more or less immunized or infected.—*British Medical Journal, July, 1901.*

A Constant Micro-organism in Scarlet Fever.—Baginsky and Sommerfeld (*Berl. klin. Woch.*, 1900, No. 28, u. 9, *Monat. fur Prak. Dermat.*, March, 2 1901) state that in all cases of scarlatinous sore throat, a prevailing streptococcus, sometimes in pure culture, more usually together with other cocci, is present. In all their investigations of scarlet fever in children, a streptococcus was found in all the organs, also in the blood and the bone marrow. This micro-organism appears as a round coccus with a single round nucleus, forming a short or long chain. It grows in alkaline bouillon, agar, blood-serum, etc. It does not liquefy gelatin. It stains slightly with all aniline stains. Specific characteristics have not yet been ascertained.—*International Medical Magazine, May, 1901.*

Culture of the Bacillus of Chancroid.— Bezançon, Griffon, and Le Sourd (*La Presse Médicale*, Dec. 12, 1900) have grown the bacillus of Ducrey on artificial media composed of rabbits' blood and agar. Pus from the initial lesion, from a lesion at inoculation, and from chancroidal bubo were employed successfully. The colonies appeared in twenty-four hours, and are fully developed in forty-eight hours. On the ordinary media all attempts at culture failed. The vitality of the organism lasts through many generations, and it was found active after many transfers.—*Journal of Cutaneous and Genito-Urinary Diseases, June, 1901.*

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IS PROFESSOR KOCH RIGHT?

PERHAPS the most remarkable fact connected with Professor Koch's announcement, in his address, that bovine tuberculosis and human tuberculosis are not precisely the same disease, but represent two distinct varieties of tuberculosis, is, that that announcement should have been regarded as a new discovery or a novel statement. To those who have kept pace with the development of knowledge in relation to tuberculosis, all the facts presented by Professor Koch have been well-known for years. We think that we are not doing any injustice to Professor Koch when we say that, so far as his address related to the pathology of tuberculosis, not a single novel fact was brought forward.

More than three years ago, Dr. Theobald Smith published, in the *Journal of Experimental Medicine*, the results of a series of experiments conducted in the Laboratory of Comparative Pathology of the Harvard Medical School, for the Massachusetts State Board of Health, in which he called attention to a number of characteristic differences between bovine and human tuberculosis. He observed the difference in the shape of the bacilli and their mode of growth, and called attention to the fact upon which Professor Koch bases his startling statement that bovine tuberculosis is not communicable to human beings; viz., that calves inoculated with human bacilli obtained from the sputum of human beings did not die from the inoculation, and that, in most instances, the pathological chances induced are comparatively slight, some cases being scarcely characteristic of tuberculosis. Dr. Smith clearly recognized all the differences between human and bovine tuberculosis which Professor Koch has more recently observed. Nevertheless he wisely refrained from taking the extreme ground which Professor Koch has taken, and with good reason, for, while his experiments showed very clearly that human tuberculosis is not readily communicable to animals of bovine species, there was a decided lack of evidence in the opposite direction; namely, that bovine tuberculosis cannot be communicated to human beings. Attention was called to the fact that numerous cases have been reported in which accidental infection of human beings with bovine tuberculosis has taken place. Dr. Smith refers to a collection of this sort by Ravenel, published in the *Journal of Comparative Medicine and Veterinary Archives*, December, 1897. He adds the following case:—

"It seems to me that, accepting the clinical evidence on hand, *bovine tuberculosis may be transmitted to children when the body is overpowered by large numbers of bacilli, as in udder tuberculosis, or when certain unknown favorable conditions exist.* [Probably much the same as in glanders. The number of glandered horses in certain places is out of all proportion of the cases in men who are continually handling and cleaning them.—ED.] To prevent this from occurring, a rigid periodic dairy inspection and removal of all suspicious udder affections and all emaciated animals, is as much as public authorities can at present demand. Any measures beyond this belong to agriculture, with which the public health has no business to meddle without endangering the chances of gaining authority to enforce its own necessary measures. If the evidence gained by pathology in the future should reveal a greater danger

than is here assumed, the scientific basis of such evidence will, I think, force all additional measures needed."

Other cases equally conclusive as regards the power of the transmission of bovine disease to human beings have been recorded by competent observers. In one instance a veterinary surgeon inoculated his finger while making a post-mortem examination of a tuberculous cow. A lesion which was clearly tuberculous, developed in the site of the infection.

Several observations made by Smith, showed very clearly that human tuberculosis is also communicable to calves, though the disease induced by it is much less active than that produced by infection from cows.

The following experiment was made by Dr. Smith: Two calves were given, at one feeding, 440 c. c. of human sputum containing tubercle bacilli. One calf, killed eighteen weeks later, was found to be suffering from intestinal tuberculosis. Thirteen tuberculous nodules were found in he intestine; the mesenteric glands were also involved. The other calf, killed at the end of nineteen weeks, was found to be free from tubercle lesions.

Another experiment, made by Sydney Martin, is quoted by Dr. Smith, in which the conclusion reached by Dr. Martin, from these and other experiments, was, that "in the case of tuberculous sputum, we are dealing with material which is less infective to calves than is bovine tuberculous material."

The facts in relation to this subject, which have been developed within the last ten years by Smith, Martin, Frothingham, and a number of other competent observers whose work antedates that of Koch, justify the following conclusions: —

1. Tuberculosis, as seen in men and cows, differs sufficiently to warrant the recognition of human and bovine varieties of the disease.

2. Human beings contract the human variety of tuberculosis more readily than bovine, while cows contract bovine tuberculosis more readily than the human variety.

3. Nevertheless human tuberculosis is communicable to cows under favorable conditions, and bovine tuberculosis is, under favorable conditions, communicable to human beings.

The fact that the infection of human beings from bovine tuberculosis cannot be directly traced more frequently than is the case, is no more singular than the fact that so few cases of glanders occur among horsemen who are constantly handling animals suffering from this disease. The fact that a large number of children do not contract intestinal tuberculosis from the use of milk from tuberculous cows, is no less remarkable in view of the facts above presented, than that there should be so small a number of calves suffering from tuberculosis from the same milk. It is well enough known that the cells of the young of all animals possess a higher degree of resistance against the tubercle bacillus than do the cells of older animals. Tubercle bacilli are quickly destroyed by contact with the gastric juice. There is abundance of evidence that the tubercle bacillus, either bovine or human, requires a preparation of tissue soil to enable it to obtain a foothold in the organism, and to develop its characteristic lesions.

Healthy cows and healthy men do not contract tuberculosis. Even when cows have been inoculated by bovine tuberculosis, the lesions remain purely local in fully half the cases, and there is reason for believing that if the conditions of life were made favorable for the animal, this might be true in all cases. Cows contract tuberculosis when they are made unhealthy by confinement indoors in illy ventilated stables, by overfeeding, and other unnatural conditions; the same is true of human beings.

In the opinion of the writer, Professor

Koch has added nothing to his laurels by his recent announcement, but has done no inconsiderable amount of harm to the cause of sanitary progress thereby. His address is well calculated to afford great comfort to butchers and packers whose consciences will no longer smite them when trimming off huge tuberculous masses from the carcasses of infected animals, and passing the remainder along to the cannery and the sausage factory.

There are two important facts outside of the question of tubercular infection which seem to be entirely overlooked:—

1. A tubercular animal must be an unhealthy animal, for it could not contract tuberculosis if it had not been a deteriorated organism, its vitality reduced, its secretions vitiated, all its functions disordered; or the tubercle germs could not have been received or held a foothold, — in other words, it was sick before it became tuberculous.

2. Tuberculosis in an animal involves something more than the mere growth of tubercle bacilli in its body, and cannot be looked upon as a condition analogous to tapeworm in the intestine, trichinæ in the muscles, or hydatids in the liver. The presence of such parasites would unquestionably interfere with the health of the host to some degree; the tubercle bacillus is an organism which influences its host to a far greater extent. It not only produces local lesions, and tissue and functional disturbances, but it manufactures a highly toxic substance, or rather several highly toxic substances, which are thrown into the circulation, and invade the whole body, giving rise to fever and other systemic disturbances, producing, sooner or later, a highly characteristic cachexia, in which every bodily function is deranged, and every tissue deteriorated; hence the tuberculous animal is saturated with disease-products, even though the tubercular lesions may be confined to the lungs, liver, or some other single organ.

It is interesting to note that a most vigorous protest was raised against the positions taken by Professor Koch at the late Congress held in England. Lord Lister, M. D., Professor Nochard, Professors Sims, Woodhead, and Bang, and other equally notable authorities, took decided issue with Professor Koch, and, from the reports of the proceedings of the Congress published in the English journals, it is clear that his views were not indorsed by the Congress.

Professor Koch himself did not claim to have proved that bovine tuberculosis is not communicable to human beings. It is important that this fact should be emphasized, since the newspapers have proclaimed in glaring headlines that "Professor Koch has made the discovery that human beings are not susceptible to bovine tuberculosis." It seems quite possible that some commercial interest has incited this wide proclamation, calculated to lull into deeper slumber a public which had only just begun to awaken to a realization of the dangers which lurk in the use of the flesh of diseased animal Perhaps the next announcement will be that Professor Koch has discovered that the flesh of tuberculous animals and the milk of consumptive cows has a real therapeutic value, and is preferable to the flesh of sound and healthy animals. There seems a very plausible foundation for such a theory. It might be suggested, for example, that the diluted tuberculin contained in the milk of tuberculous animals affords a most convenient and natural method of developing immunity in the human organism, by the administering of tuberculin therapeutically to persons suffering from the disease. Progress along this line may lead to the establishment of institutions for the treatment of disease by this new method. Commercial enterprise may place before our eyes in circulars and in the public prints glowing accounts of consumptive retreats which offer among other attractions, "a fine herd of tuberculous Jerseys, well

advanced in disease; milk guaranteed to be strongly tuberculinized;" and bills of fare announcing "tuberculous steaks *à la* Salisbury, rare and juicy; fine, large tuberculous glands, toothsome and tender; tuberculous lungs, served to order for consumptives; tuberculous livers, spleens, pancreas, etc., for those suffering from visceral infections;" and so on.

It is possible to pursue an idea so far as to leave reason, good judgment, and common sense behind. The flesh of animals, under the best possible conditions, is inferior and secondhand food. The food elements provided by the vegetable kingdom are in no wise improved by passing through the animal organism; they are necessarily to some degree deteriorated by the admixture of waste substances. The juices of all animals are filled with purin bases, urea, uric acid, and other excretory substances, as has been so well pointed out by Bunge, Bouchard, and other physiological chemists, and recently in an able paper on the "Genesis of Uric Acid," by Professor Chittenden, of Yale College. When to these toxic substances are added the effete matters which are produced in prodigious quantities by the infected organism and the special poisons produced by the tubercle bacillus when developing in the animal body, it would seem that reason enough exists to choose something better for human sustenance.

Professor Koch's announcement is well calculated to make every butcher, meat-packer, and dairy man "rejoice and be exceeding glad," but if his utterance should be allowed to have any decided influence upon sanitary legislation, or the action of dairy and food inspectors, the result would be a slaughter of innocents compared with which the cruel act of Herod would sink into insignificance, and the tear-stained faces of thousands of bereaved mothers would turn toward Heaven in protest against this sad misapplication of pathological learning.

THE URINARY TEST-MEAL.

THE gastric test-meal has placed the study of the chemistry of digestion upon a thoroughly accurate and scientific basis. It is now possible to know exactly the amount and kind of work which the stomach does under any given conditions. By a combination of the Hayem and Winter method with the Toepfer method of gastric analysis, and adding quantitative estimation of the products of salivary digestion, absolutely exact data can be obtained, by a comparison of which with the normal standard, every deviation of the gastric chemism from the natural condition may be readily detected.

The marvelous advances made in physiological chemistry have given us almost equally accurate methods for determining the character and quality of the constituents of the urine, but these invaluable means of diagnosis have been, up to the present time, of comparatively little value because of the neglect to establish the conditions necessary for accuracy. The gastric fluid obtained after a miscellaneous meal is of little or no value in determining the conditions of the gastric chemism. To be of value, the gastric fluid must be obtained after a test-meal of known quantity and constituents, so that the results of the analysis can be compared with other results obtained under like conditions.

In urinary examinations, the fact that the constituents of urine vary to a great extent with the variation in diet has been practically ignored, except in special laboratory researches. The time has certainly arrived when the necessity for greater precision in urinary analysis must be recognized. Variations in diet give rise to a very great variation in the urinary constituents. This is especially true respecting the nitrogenous constituents. Not only the amount of urea, but especially the amount of uric acid, varies to a marked extent with the amount and

character of the albuminous elements contained in the food; for example, the body normally requires about the equivalent of three ounces of dry albumin daily to repair the wastes resulting from tissue work. Any excess of this amount must result in a considerable increase in the amount of urea, while a deficiency will lessen the,

FULL RATION.

	Amt.	Per cent.			Ounces.		
	Oz.	Prot.	Fat.	Carbo.	Prot.	Fat.	Carbo.
Granose	16	15.4	2.3	79.1	2.46	.398	12.65
Almonds	2	21.	54.9	17.3	.42	1.098	.34
Cherries	24	.7		12.	.16		2.83
Total	42				3.04	1.49	15.87
Granola	18	15.	3.	75.	2.7	.54	13.5
Malt honey	12	3.87		14.9	.46		1.78
Peaches	6	.7		14.6	.05		1.16
Tota	36				3.21	.54	16.54
Grānut	20	11.35	1.41	77.06	2.31	.282	15.41
Almond butter	2	21.	54.9	17.3	.43	1.098	.34
Malt honey	7	3.87		14.91	.27		.83
Total	29				3.01	1.38	16.58

THREE-FOURTHS RATION.

	Amt.	Per cent.			Ounces.		
	Oz.	Prot.	Fat.	Carbo.	Prot.	Fat.	Carbo.
Peas	8	24.6	3.5	52.6	1.968	.280	4.208
Butter	2		84.4	6.		1.688	.12
Granose	7	15.4	2.3	79.1	1.078	.101	5.43
Total	17				3.04	2.1	9.78
Almond butter	4	21.	54.9	.3	.84	2.196	.692
Granola	14	15.	3.	.	2.1	.45	10.5
Total	18				2.94	2.64	11.19
Grānut	10	11.65	1.41	.76	1.155	.141	7.06
Malted nuts	8	23.7	27.6	.	1.896	3.208	3.512
Total	18				3.04	2.3	11.2

ONE-HALF RATION.

	Amt.	Per cen			Ounces.		
	Oz.	Prot.	Fat.	Carbo.	Prot.	Fat.	Carbo.
Grānut	6	11.55	1.41	77.06	.92	1 12	6.16
Almond butter	2	21.	54.9	17.3	.42	1.1	.35
Protose	8	21.3	10.23	2.85	1.27	.61	.66
Strawberries	12	1.1	.5	6.8	.13	.06	.81
Total	28				2.74	2.89	7.91
Granola	6	15.	3.	75.	.9	.18	4.5
Milk	20	4.	3.9	5.2	.82	.78	1.04
Malted nuts	5	23.7	27.6	48.9	1.18	1.38	2.19
Total	31				2.9	2.3	7.7
Gluten biscuit		40.	2.2	45.	2.	.11	2.25
Almond butter		21.	54.9	17.3	1.05	2.745	.86
Total	10				3.05	2.85	3.11

amount of urea normally eliminated; hence it is a matter of considerable consequence whether the individual whose urine is subject to examination, has, within the twenty-four hours during which the urine has been accumulating, eaten freely of meats, eggs, or other nitrogenous foodstuffs.

In order that the results of urinary examination should be to any considerable degree accurate, the physician must insist upon a carefully determined and specified dietary. For convenience it is best that the diet should consist of the normal ration, which practically consists of 16 ounces of starch, 3 ounces of albumin, and 1½ ounces of fat, it being understood that the weight of the elements named is estimated "water-free." The normal ration should be administered for twenty-four hours before beginning to save a twenty-four-hour specimen for examination, and also while the second twenty-four-hour specimen is being saved. It is often useful also to obtain a specimen for comparison while the patient is subsisting upon his ordinary fare. The writer has prepared a number of balance normal rations, of which the patient is allowed to take his choice. On the preceding page are a few rations which have been tested for practical use for some months.

In examining the urine for uric acid, it is especially important that the patient should avoid the use of beef tea, animal broths or soups, beefsteak, mutton chops, or any other flesh foods, and that especially he should avoid the use of such foods as sweet-breads, liver, kidneys, etc., since all these foods contain a large amount of uric acid, as shown by Chittenden and others, a double or even a triple amount of uric acid contained in the twenty-four-hour specimen of urine. The amount of uric acid, according to Chittenden's investigations, contained in the urine of a person subsisting upon a uric-acid-free diet, is about .4 grams per diem.

The examination of the urine of several hundred persons subsisting upon a uric-acid-free diet, made in the physiological laboratory of the Battle Creek Sanitarium, gives practically the same average. On a mixed diet the amount of uric acid is found to be double; and when the pancreas, liver, or kidneys are eaten, the quantity of uric acid rises to three times the normal.

THE ABUSE OF DRUGS.

A WRITER in the *Canadian Practitioner* for December, 1900, calls attention to one of the greatest evils of our modern times,—"the indiscriminate taking of drugs as proprietary nostrums." Many years ago, Claude Bernard wrote a charming biological work on "Some American Fishes," in which he made the interesting observation that "all life is under water."

Recent experiments made in the biological laboratories at Wood's Hole, Mass., show that biological processes of all sorts may be modified to a marvelous extent by modifications of the character of the medium in which various low forms of life are growing. Curious deformities, monstrosities, and various modifications of life were made by the addition of various substances to the water in which the living forms were developing.

Strange it is that when taking into our bodies foods or medicines, we do not stop to think that we are modifying the medium in which we live and move and have our being. The liver, stomach, and every other organ does its work under water. We even think under water; every cell of the body is bathed with a watery solution of food substances. By the habitual use of drugs of any sort this nutrient medium is modified. If poisonous substances are taken, every cell in the body must be thereby more or less influenced. It is in this way that the drunkard comes to get his rum blossom,

his degenerated brain, and his general bloated appearance. It is likewise in this way also that the tobacco user acquires his leathery-like skin and dingy sclerotica, and the chronic tea toper her saffron complexion. The saturation of the body with the poisons contained in alcoholic beverages, tobacco, and tea or coffee, modifies the metabolism of the body in a harmful way. The same thing must be true of any poison habitually received into the body. The liquor habit is a stupendous evil. The raising, manufacture, and sale of tobacco is a soul- and body-destroying traffic. The manufacture and sale of patent nostrums with which the drug stores of the land are filled, and of which many trainloads are annually swallowed by a gullible public, is an evil scarcely less in proportion, and is unquestionably one of the causes which are undermining the constitutions of the American people.

It is strange indeed that the manufacturers of patent nostrums are permitted o manufacture and sell drugs intended to produce abortion, whereas a physician who would make a prescription or perform an operation for such a purpose would be a criminal in the eye of the law. "This," says a writer in the *Practitioner*, "is a crying evil, which ought to be remedied." Physicians understand these matters as the common public cannot, and it is the duty of the members of the profession to see to it that proper laws are enacted which shall protect the ignorant public from the abuses which are practiced upon them by cunning sharks who have not the slightest hesitation in sacrificing the health and even the lives of multitudes in order that their pockets may be enriched.

The writer referred to makes two excellent suggestions, one of which is, that a law should be enacted prohibiting the sale of all nostrums containing poisons; and second, that every nostrum should bear upon its label an exact formula of its composition, printed in plain language, so that they may know the exact composition of the dirty water and other rubbish he is swallowing.

THE TRUTH ABOUT CHEESE.

WHERE or when the use of putrid milk in the form of cheese originated, history says not, but certain it is that in most civilized lands the practice of eating decayed milk is almost universally prevalent. As long as germs are looked upon as capable of assisting the digestive process because they soften and dissolve certain elements of the food, lovers of Limburger and Roquefort cheese are able to offer a plausible argument in behalf of its use; but since it has been conclusively shown by the revelations of the physiological laboratory that the action of germs upon the casein and other undigested products is not to produce a normal peptone, but toxic substances, ptomains, and various other toxins which, when absorbed into the blood, are capable of producing highly toxic effects and numerous disorders of tissue and function, then arguments are becoming lame. The editor of the *Dietetic and Hygienic Gazette* has recently spoken plain and wholesome words upon this subject, which we are glad to quote: —

"What is the matter with the cheese?

"Simply this, that it has come to be an almost universal belief that coagulated casein and butter fat, which are its constituents, must be 'cured.' This 'curing' process is chiefly accomplished by time. It is not considered fit to eat until it is old enough and rank enough — from gradual processes of decomposition — to be buried. The average palate has been gradually educated to relish cheese after it has undergone butyric-acid fermentation, and is, in fact, putrid. This is plain English, and it flies in the face of reigning authorities on gustatory stand-

ards. Certain brands of the stuff, as Roquefort, Limburger, and several other varieties, sell at enormous prices simply because they represent the ideal degree of rankness — putridity.

"This butyric fermentation has its proper bacillus, and in case of the special varieties present in Limburger and other delectable brands, the characteristic odor is vile enough and strong enough to bar attempts at counterfeiting or substitution. The flavor comports with the smell, and either one would cause a respectable canine to drop his astonished tail and sneak out of the rankest soap factory or tanyard on the face of the earth.

"Every normal stomach rebels at it, and every normal palate repudiates it at sight, taste, or smell. Years ago when all the small dairymen made a little cheese for their own use, if not for the market, they began to eat it before it was a fortnight old, ate it as freely as they did bread, and never thought of it as being difficult of digestion. Nor was it.

"To put such compressed casein before a lover of Limburger would be to offer him an unpardonable insult. And yet, from a health standpoint, it is the only cheese that can be approved.

"Of the semi-putrid, rank-smelling, and acrid-tasting stuff now sold for cheese, any person cannot partake with impunity; and those who do eat it are compelled to be very sparing in their indulgence, making it a relish or condiment rather than a food. This is because it belongs with 'embalmed beef,' moldy bread, and gangrenous 'game,' for which palled palates either profess or possess a gusto."

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HOWARD RAND, M. D., Urinalist.
NEWTON EVANS, M. D., Pathologist.
ELMER L. EGGLESTON, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS FOR SEPTEMBER.

Gastric Laboratory.—

	Hyperpepsia.		Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	C	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	59	100	18	100	98	.94	175	.99
Less than 10,000 bac.								
Between 10,000 and 100,000 bac.					1	.10	1	.005
More than 100,000 bac.					5	.05	5	.
Total	59	100	18	100	104	100	181	100

Patients received from the following States and countries: Washington, 1; Louisiana, 2; Montana, 2; Jamaica, 1; Denmark, 1; Mississippi, 3; Texas, 1; North Carolina, 2; North Dakota, 1; Colorado, 1; Missouri, 6; Nebraska, 3; England, 1; Arkansas, 3; Virginia, 1; Alabama, 3; Wisconsin, 4; Iowa, 6; Kansas, 6; New York 3; Vermont, 1; Indiana, 21; New Jersey, 1; Canada, 5; District of Columbia, 1; Ohio, 27; Minnesota, 3; Michigan, 13; West Virginia, 4; Illinois, 22; Kentucky, 7; Pennsylvania, 7; Ontario, 16; New Brunswick, 2.

Examinations of Blood.—

Hemoglobin.	Men.	Women.	Total.
100 per cent and over	65	20	85
90–100 " "	79	85	164
80– 90 " "	25	38	63
70– 80 " "	9	13	22
50– 70 " "	2	8	10
Below 50 per cent	3	0	3
Total	183	164	347

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	93	54	147
4,500,000 and 5,000,000	39	50	89
4,000,000 " 4,500,000	28	30	58
3,500,000 " 4,000,000	6	23	29
3,000,000 " 3,500,000	4	6	10
2,500,000 " 3,000,000	7	1	8
Below 2,500,000	6	0	6
Total	183	164	347

Examinations of Sputum.—There were 29 examinations made, 22 being new cases. Tubercle bacilli were found in 5 cases.

Urinary Laboratory.—Total number of specimens examined, 780; number of new cases, 398; Specimens containing albumin, 36; sugar, 9; casts, 17; pus, 82; blood, 2.

THE ART OF MASSAGE,

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MODERN MEDICINE

VOL. IX. BATTLE CREEK, MICH., U. S. A., NOVEMBER, 1901. NO. 11.

ORIGINAL ARTICLES.

HYDRIATIC SUBSTITUTES FOR ALCOHOL.[1]

BY J. H. KELLOGG, M. D.,

Superintendent of the Battle Creek (Mich.) Sanitarium.

(Concluded.)

2. THE effect of alcohol is to cause dilatation of the peripheral vessels. This it does by paralyzing the vasoconstrictors.

As already stated, paralysis of the peripheral vessels and of the vasomotor centers of the medulla, as shown by Romberg and Paessler, are the real causes of heart failure; hence alcohol, in its effect upon the vasomotor centers and nerves, can only aggravate the very condition for the relief of which it was administered. Alcohol at the same time exercises a like effect upon the accelerator nerves of the heart, which are both anatomically and physiologically associated with the vasoconstrictors, as Waller has so clearly pointed out. By this means, while the heart's action seems to be freer, the movement of the blood through the systemic circulation is slowed, as is shown by the stasis in the peripheral vessels, which is clearly indicated by the dusky hue of the skin in a man under the influence of alcohol. The influence of alcohol is in this respect somewhat akin to that of the warm bath.

The effect of a cold application, however, is the very opposite; viz., the stimulation of the vasoconstrictors. At first this effect is so pronounced that the blood-vessels are almost completely emptied of their contents, and the skin becomes blanched in appearance. As reaction sets in, the caliber of the blood-vessels is increased, but stimulation of the vasoconstrictors continues in that wonderful rhythmic activity of the small vessels, the peripheral heart, whereby the blood is steadily pumped from the arterial into the venous system, resulting in a bright red flushing of the skin, which indicates an increased flow of the blood through the periphery, and an increased rate of movement throughout the circulatory system.

3. It is not maintained that no preparation for the cold bath is needed, but rather that there is a far better method than by the use of alcohol. The ideal preparation is to be found in the application of heat. If alcohol in any way aids reaction, it is not by augmenting the activity of the nerve centers, but by encouraging the relaxation of the surface vessels. But this can be accomplished far better either by a general or a local application of heat, as a foot bath, fomentations to the spine, or, when convenient, a general application of heat, such as a hot full bath for one or two minutes, a hot blanket pack, a hot shower, or even hot water drinking or a hot enema, or wrapping the patient in warm woolen blankets for half an hour or so, with hot bags about him. All these are measures whereby the preparation for the cold bath may be accomplished far more efficiently than by any form of medication.

Heat is a natural preparation for cold. The application of heat to the surface vessels is a physiological stimulus whereby the centers are aroused to activity, and the thermic nerves rendered in the highest degree capable of responding to the reflex stimulus which the cold applications communicate to the skin, and through it to the nerve centers.

4. While it is true that the patient *seems* to bear the cold bath better when alcohol is administered, this fact is the strongest kind of argument against the use of alcohol in this connection; for the only way in which alcohol can diminish the shock or lessen the discomfort of the patient in the application of cold water, is by lessening nervous sensibility through its narcotic effect; and just so far as this

[1] Read by title before the American Medical Temperance Association held at St. Paul, Minn., June 4-7, 1901.

is accomplished, the effect of the bath is neutralized and its efficacy lessened, for the reason that the whole effect of the cold application depends upon the thermic impression made upon the skin. Thus, so far as this impression is diminished, the effect of the bath itself is diminished; the combination of such antagonistic measures as alcohol and cold water cannot be regarded otherwise than in the highest degree unphilosophical, and, from the standpoint of rational therapeutics, absurd. The practice is one which appeals strongly not only to the prejudices of the laity, but to the predilections of quite too large a proportion of physicians; but not one scientific fact or even plausible apology can be brought forward in support of this practice.

The utility of the cold bath as originally practiced by Brand cannot be questioned; but Winternitz has shown that the rate of heat elimination may be very greatly increased by rubbing the patient continuously during the bath. At the present time Brand and his followers, who are adepts in the use of the cold bath in fever, uniformly employ vigorous friction during the entire bath. Those authors who forbid friction during the bath because of the supposition that heat production may thereby be increased, evidently do not recognize the fact that by the maintenance of a vigorous surface circulation the rate of heat elimination is increased out of proportion to the slight increase of heat production, so that there is a decided gain to the patient by the friction employed during the bath. These writers especially neglect the important fact that the greatest benefit derived from the cold bath is not the simple heat abstraction, but the general rousing of the vital powers, the increase of resistance, and the quickening of the recuperative and reparative activities of the body.

Another advantage of this method is that the patient is much more comfortable in the bath, and will tolerate the application for a longer time and at a lower temperature, as well as more frequently, than when it is administered without friction. As elsewhere shown, friction also averts increase of heat production by preventing shivering.

The claim made by some authorities that friction during the bath lessens the permanency of its effects in temperature reduction, is perhaps correct to a degree, but this only necessitates the more frequent use of the bath, which the friction renders readily tolerable.

How, then, may we explain the good effects obtained by the method of Brand? The explanation is to be found, not in the subtraction of heat alone, but especially in the tonic effects of the cold water, and in the sedative influence upon the nervous reflexes concerned in the febrile process, and in the powerful diuretic effects of the bath.

Ziemssen first, and later Glénard, recommended in high terms the so-called graduated bath, in which the patient is placed in an immersion bath, the temperature of which is three and one-half to four degrees below that of the body. The temperature is then steadily lowered at the rate of about one degree every three minutes, until a temperature of 86° F. is reached. This method has the advantage that no shock is produced, as when the patient is placed in water at 68° by the Brand method. There is, accordingly, no marked thermic reaction. If desirable, the temperature may be lowered still more, or until the patient becomes slightly chilly, but he should not be allowed to shiver. The bath should be accompanied by gentle friction for the purpose of preventing chill, and increasing heat elimination.

With feeble patients who chill easily, the lowest temperature of the bath may be made 90° or 92° F. in the first application, the bath being more prolonged than when the lower temperature is employed. In such cases the temperature of the bath should be lowered one or two degrees at each application until the temperature of 70° or 75° is reached.

The graduated bath obviates the danger from syncope, which is one of the inconveniences of the cold bath. It may be employed in cases in which the cold bath is contraindicated, as in cases of typhoid with serious renal or cardiac complications.

The results in temperature reduction obtained by the graduated bath are more permanent than those obtained from the cold bath of Brand or the cold affusion of Currie; and after several years' experience with this bath, the writer considers the graduated bath one of the most efficient and satisfactory of all methods employed for reducing temperature in fever. Unfortunately, it is much less convenient for

use in the ordinary home or in private practice than in hospitals. There are, however, other means by which very similar, and perhaps equally good, effects may be secured.

When the cooling wet-sheet pack is employed for the reduction of temperature, the sheet should be wet in cold or cool water, and should be wrung out slightly, then wrapped about the patient in such a manner as to come into immediate contact with every part of the body, being tucked in closely around each limb and about the neck. The patient should be covered very lightly if at all. In a few moments the temperature of the sheet will be raised to nearly that of the body, when it should be renewed, a fresh pail of cold water being employed each time for wetting the sheet. The sheet should be wrung out as dry as possible, in order to remove the warm water which it contains, before dipping into the cold water for the second application. It is better to use two sheets, having the freshly prepared sheet on another couch.

The application may be renewed in this manner five or six times in succession, or even more. When the temperature of the body is very high, the sheet is so rapidly heated that it must be renewed every five to seven minutes, to make the cooling effect continuous. The applications should be renewed until the temperature has been lowered one degree or more, or until reduced to 101° or less, each successive application being longer than the preceding. There should be good circulatory reaction to maintain an active cutaneous circulation. It is often well to secure this by friction with the hand outside the sheet.

Instead of removing the sheet from the patient, the same effect may be accomplished by opening the sheet and sprinkling the body as well as the sheet with cold water. The patient should be made to turn first upon one side and then the other, so that the back and the whole body may be exposed to the cold application.

A better method still is to place the patient upon a cot covered with oilcloth, so arranged in relation to a tub placed at the foot of the cot that any surplus water may be caught as it runs away; then the water may be turned upon the patient from a watering-pot or poured over him either from a dipper or other convenient vessel. By this means the cooling effect of the sheet may be made continuous, and almost as intense as that of the cold bath.

The late Dr. Austin Flint introduced this form of cooling bath in 1874, when the writer was a pupil under him in Bellevue Hospital. In a paper read by him before the Academy of Medicine at that time, he reported several obstinate and protracted cases of remittent malarial fever with very high temperature, that were rapidly cured by this measure repeated daily.

Water at any desired temperature may be used. If the patient does not well tolerate cold applications, water at a temperature of 80° or even 85° F. will be found efficient in lowering the temperature, provided the application is continued for a sufficient length of time.

The cold towel bath is essentially the same as the cold sponge bath, but is applied somewhat differently. A towel of ordinary size is wrung out of cool or cold water, and spread out quickly over as large an area as possible. The hands are applied with a rubbing movement, outside, not under, the towel, first one part then another, until the whole towel is slightly warmed, when it is quickly renewed by dipping in cold water and wringing slightly, and applied to an adjacent or corresponding surface; and so on until the entire body has been gone over, the operation being continued as long as may be necessary to produce the desired results. This method is applicable only to cases in which there is but a slight rise of temperature, or where the patient is too feeble to be subjected to more vigorous measures. Each part must be quickly dried, rubbed, and covered after the application before proceeding to the next.

The cold towel rub, the towel being wrung as dry as possible, is of great service in cases in which the patient is in a dynamic state, with cold extremities, pinched features, and marked depression. Especial attention should be given to the limbs, and the application must be short and instantly followed by vigorous rubbing. Partial cold rubbings test the patient's reaction and preparation for more vigorous applications, such as the cooling pack and the graduated bath.

The cold wet friction bath, administered by means of the cold friction mitt, is a most useful measure in cases of fever in which the condition of the patient

demands a cold application to lower the temperature, energize the heart, and increase vital resistance, but in which there are conditions that contraindicate the ordinary cold immersion or Brand bath. It is a most valuable antipyretic measure, and is always indicated in fever, except in cases in which cold applications must be forbidden altogether, as when the patient is perspiring freely. It may be employed even when the skin is cold or cyanotic. It is possible to use water at a very low temperature, even ice water, in administering this treatment. It is of the greatest possible service in the adynamic or ataxo-adynamic conditions of typhoid fever, in cases in which serious cardiac or renal complications have appeared in intestinal hemorrhage, and in collapse from hemorrhage or perforation. It rouses the vital powers in a wonderful manner, brings to the surface the blood which is stagnating in the viscera, awakens the lethargic brain, slows and strengthens the fluttering pulse, and completely changes the aspect of an apparently desperate case, and often in a very brief space of time, a few hours, even. The bath may be perfectly graduated. At first the mitt should be only moistened. As the circulation improves, it may at the next application be saturated, and later it may be filled.

After twenty-five years of extended experience in the use of baths at all temperatures, the writer feels justified in taking a most uncompromising stand against the use of alcohol in any form in connection with hydriatic procedures. If there are any two agencies in the world which are absolutely irreconcilable, they are alcohol and water. Their application in conjunction gives, not the sum of two co-operating or complementing agents, but the difference between two neutralizing and antagonistic measures. In any case in which alcohol may seem to be indicated as a means of preparing the patient for the application of a cold bath, heat may be employed to far better advantage with the certainty of better results, and with absolute physiological consistency.

POW'FUL MED'SIN.

A COLORED woman threw the odds and ends of medicine left after her husband's death into the fire. The explosion that followed carried the stove through one of the windows. "Mos' pow'ful movin' med'sin' I eveh saw'd," she said. "No wondah de ole man gone died.

WAS LUIGI CORNARO RIGH ?[1]

BY E. H. VAN SOMEREN, M. R. C. S.,
Venice.

BEING a young and obscure general practitioner, it is with some trepidation and an apology that I present myself before this Section. The reasons for my doing so are: First, that I believe that a hitherto unsuspected reflex in deglutition has come to light, which has an important bearing on health, on the prevention of disease, and on metabolism; secondly, that any theory whatever based on a possible physiological function claiming to diminish, as this does, the amount of sickness and suffering now existent, should have serious investigation; thirdly, that I desire to enlist your skilled help in the consideration of theories I have doubtless crudely erected on my premise.

According to the Encyclopedia Britannica, Luigi Cornaro (1467 to 1566) was a Venetian nobleman famous for his treatises on a temperate life. Through some dishonesty on the part of his relatives he was deprived of his rank, and induced to retire to Padua, where he acquired the experience in regard to food and regimen which he has detailed in his works. In his youth he lived freely, but after a severe illness at the age of forty, he began, under medical advice, gradually to reduce his diet. For some time he restricted himself to a daily allowance of twelve ounces of solid food and fourteen ounces of wine; later in life he still farther reduced his bill of fare, and he found that he could support his life and strength with no more solid meat than an egg a day. So much habituated did he become to this simple diet, that when he was above seventy years of age the addition, by way of experiment, of two ounces a day nearly proved fatal. At the age of eighty-three he wrote his treatise on the "Sure and Certain Method of Attaining a Long and Healthful Life," and this work was followed by three others on the same subject, composed at the ages of eighty-six, ninety-one, and ninety-five respectively. "They are written," said Addison (*Spectator*, No. 195), "with such a spirit of cheerfulness, religion, and good sense, as are the natural concomitants of temper-

1 Reprinted from the *British Medical Journal*, Oct. 12, 1901

ance and sobriety." He died at the age of ninety-eight.

Now, was Luigi Cornaro right? Did he make use of a physiological process unknown to us, of the value of which he was not cognizant? To live to an advanced age must we be as temperate as he, reducing the quantity of our food to the minimum required by nature?

That we all eat more than we can assimilate is unquestionable. How can we determine the right quantity? Instinct should guide us, but an abnormal appetite often leads us astray. Nature's plans are perfect, if her laws are obeyed. Disease follows disobedience. Wherein do we disobey?

We live not upon what we eat, but upon what we digest; then why should undigested food, recognizable as such, be deemed a normal constituent of solid egesta?

Something like the following must be a common experience to general practitioners, especially to those practicing on the Continent. The patient comes to see us, and volunteers the information that he or she has gout, rheumatic gout, or dyspepsia. Symptoms are asked for, the case is gone into carefully for causation. An appropriate diet and an appropriate bottle of medicine are prescribed. As the patient leaves the room, we may, or may not, call attention to the fact that both teeth and saliva are meant to be used. The patient returns, better, unaffected, or worse. If better, he remains so while under treatment, and relapses when he returns to ordinary habits. If unaffected or worse, we try again and again until we despair, then take or send him to a consultant. Temporary benefit, possibly owing to renewed hope, results, but finally the unfortunate gets used to his suffering, and, if he can afford it, is sent to join the innumerable host that wander from one "Bad" to another, all over Europe, trying, praising, and damning each in turn.

Their manner of living is of course at fault. Nature never intended that man should be perpetually on a diet and hugging a bottle of medicine, nor did she ordain that he should go wandering over the map of Europe, drinking purgative and other waters.

Though early yet to speak with certain voice, it would seem that we are provided with a guard, reliance on which protects us from the results of malnutrition. There seems to be placed in the fauces and back of the mouth a monitor to warn us what we ought to swallow and when we ought to swallow it. The good offices of this monitor we have suppressed by habits of too rapid eating, acquired in infancy or youth.

Last November, my attention was called by Mr. Horace Fletcher, an American author, living in Venice, to the discovery in himself of a curious inability to swallow, of a closing of the throat against food unless it had been completely masticated. My informant stated that he noticed this peculiarity after he had begun excessively to insalivate his food, both liquid and solid, until all taste had been removed from it. The tasteless residue in the mouth being refused by the fauces, it required a forced muscular effort to swallow it. He further told me that since adopting this method of eating, he had been cured of two maladies, adjudged chronic, the suffering from which rendered him ineligible for life insurance. His weight had been reduced from 205 to 165 pounds. He had practiced no abstemiousness, had indulged his appetite, both as to selection and quantity, without restraint, and for the last three years had enjoyed perfect health.

After his cure he was accepted without difficulty, the last examination finding him an unusually healthy subject for his age. Having leisure, he had spent three years in investigating the cause of his cure, had pursued experiments upon others, and had extended his inquiries in both America and Europe, until our meeting in Venice. He had also published a statement and inquiry in book form, entitled "Glutton or Epicure," which had been favorably reviewed by the *Lancet*.

For nearly a year I had also been experimenting upon myself and others with various diets, and was ready to believe that in the manner of taking food, and not altogether in its varying matter, lay perhaps its protean effect on the system. I at once adopted the same method of eating. At the end of six weeks I noticed that not only did the fauces refuse to allow the passage of imperfectly prepared food, but that such food was returned from the back to the front of the mouth by an involuntary, though eventually controllable, muscular effort, taking

place in the reverse direction to that occurring at the inception of deglutition.

What actually happens is this: Food as it is masticated, slowly passes to the back of the mouth, and collects in the glosso-epiglottidean folds, where it remains in contact with the mucous membrane containing the sensory end-organs of taste. If it is properly reduced by the saliva, it is allowed to pass the fauces, a truly involuntary act of deglutition occurring. Let the food, however, be too rapidly passed back to these folds, that is, before complete reduction has taken place, and the reflex muscular movement above referred to, occurs. The process of this reflex is as follows: The tip of the tongue is involuntarily fixed at the backs and bases of the lower central incisor teeth by the anterior fibers of the genio-hyoglossi muscles. With this fixed point as a fulcrum, the lower and middle fibers of these muscles, aided by those of the stylo-hyoid and stylo-glossi muscles, raise the hyoid bone, straighten out the glosso-epiglottidean folds, passing their contents forward by the fauces, the opening of which is closed by approximation of its pillars and contraction of the superior constrictor. The tongue, arched postero-anteriorally by the genio-hyo-glossi, palato, and stylo-glossi muscles, laterally by its own intrinsic muscles, is approximated to the fauces, soft and hard palates in turn, and thus the late contents of the glosso-epiglottidean folds are returned to the front of the mouth for further reduction by the saliva, preparatory to deglutition.

The word "reduction" is used for the reason that all foods tested were found, without exception, to give an acid reaction to litmus when served at table. The reflex muscular movement occurs in the writer's case from five to ten times during the mastication of each mouthful of food, according to its quantity and its degree of taste; as often as it recurs, the returned food continues to give an acid reaction, while food allowed to pass the fauces is alkaline.

Saliva, flowing in response to the stimulation of taste, seems more alkaline than that secreted in answer to mechanical tasteless stimulation. It is found that the removal of taste from any given bolus of food coincides with complete alkaline reduction. The fiber of meat, gristle, connective tissue, the husk of coarse breads, and cellulose of vegetables are carefully separated by the tongue and buccal muscles, and rejected by the fauces. To swallow any of these necessitates a forced muscular effort, which is abnormal.

Adult man was not originally intended to take his nourishment in a liquid form, consequently all liquids having taste, such as soups, milk, tea, coffee, cocoa, and the various forms of alcohol, must be treated as solids with taste, and insalivated by holding them in the mouth, moving the tongue gently with straight up-and-down masticatory movements until their taste is removed. Water, not having taste, needs no insalivation, and is readily accepted by the fauces.

In explanation of the phenomenon described, the following theory is advanced: The fauces, back of the tongue, epiglottis,—in short, those mucous surfaces in which are placed the sensory end-organs of taste and "taste buds" (the distribution of which, by the way, has yet to be explained),—that these surfaces, readily becoming accustomed to an alkaline contact by excessive insalivation and consequent complete alkaline reduction of the food, afterward resent an acid contact, and express their resentment by throwing off the cause of offense by the muscles underlying them.

This phenomenon must not be confused with the cases of rumination and regurgitation which from time to time are recorded. The food in these cases is not swallowed, nor does it pass any point from which it can be regurgitated. Eighty-one individuals of different nationalities, and from several classes of society, whom we have studied, are now in conscious possession of their reflexes. The reflex seems readily educated back to function by all who seriously and patiently adopt the habit of what seems at first to be only excessive insalivation.

The dictum, "bite your food well," that we so often use, has no meaning to those suffering from the results of malnutrition, especially should they have few or no teeth of their own. I make so bold as to state that dyspepsia *et morbi hujus generis omnes*, will cease to exist if such patients be persuaded to bite their food until its taste disappears and it is carried away by involuntary deglutition.

The important point of the whole question seems to be this alkaline reduction of acid food before it passes on to meet

digestive processes elsewhere, which then become alternately acid and alkaline.

In the first few months of infant life, when saliva is not secreted, nature ordains that mammary secretion be alkaline. With the eruption of teeth comes an abundant flow of saliva, and a synchronous infantile capacity for managing other foods. This flow of saliva depends on a thorough demand and use to maintain its generous supply. It is just at this time that children learn to bolt their food, and the demand fails, with a consequent detriment to the salivary glands, the digestive processes, and the system generally.

A, B, C, and D were placed on an absolute milk diet. A drank his milk in the ordinary way, and at the end of three days begged to discontinue the experiment. B, C, and D insalivated theirs, but to a varying extent — B the least, and D the most. Though D took most milk, he excreted least feces; C excreted less than B. Can one infer that increased insalivation of a non-starchy food insures its better digestion and assimilation?

As long ago as the seventeenth century, before the transformation of matter into energy by the animal organism known as metabolism was understood, the fact was recognized that by the lungs, kidneys, skin, and intestines substances no longer useful to the organism were eliminated, the retention of which would prove harmful. The nature of these substances was unknown, but it was noted that however much the food was increased, the weight of the body remained the same. In other words, a state of complete nutritive equilibrium was maintained. The table [exhibited] contains the summary of two experiments in which a state of complete nutritive equilibrium was maintained by individuals of about the same weight on widely different quantities of food similar in quality. The subjects of experiment were a laboratory assistant of Dr. Snyder, of the United States Department of Agriculture, and the writer. The experiment of the former was made primarily to show the relative digestibility of the several articles of diet,— potatoes, eggs, milk, and cream.

"Considerable importance has been attached to the normal action of bacteria in the intestines, and it has even been supposed that the presence of bacteria is essential to life. Such a view has recently been shown to be erroneous by an elaborate and painstaking research carried out by Nuttall and Thierfelder, who obtained ripe fetal guinea-pigs by means of Cæsarean section carried out under strict antiseptic precautions. They introduced the animals immediately into an aseptic chamber through which a current of filtered air was aspirated, and fed them hourly on sterilized milk day and night for over eight days.

"The animals lived and thrived, and increased as much in weight as healthy normal animals subjected to a similar diet for the purpose of controlling the results. Microscopic examination at the end of the experiment showed the alimentary canal contained no bacteria of any kind, nor could cultures of any kind be obtained from it.

"The same writers in a subsequent paper described the extension of their research to vegetable food; this was also digested in the absence of bacteria. Under such conditions cellulose was not attacked. Hence, they consider that the chief function of this material is to give bulk and proper consistency to the food, so as to suit the conditions of herbivorous digestion." ("Schäfer's Physiology," p. 465, Vol. I.)

Now inasmuch as bacterial digestion has no place in the animal economy, surely it can occur only at the expense of the organism. Can micro-organic action take place in the intestines without the production of toxins and the consequent absorption of these toxins into the blood?

We know that the metabolism of a cell is determined by the general physical environment of the whole organism, by supplies of oxygen and water on nervous impulses, and, what chiefly concerns this argument, on the nature and amount of the pabulum supplied to it. This pabulum is derived from the alimentary canal. Are not even those of us who may be enjoying seemingly the best of health, supplying to our tissues pabulum containing mild toxins, thus causing an increased katabolic action to occur in each individual cell of our bodies? Are not the blood elements floating in a plasma containing such toxins rendered resistant, weaker, less capable of fulfilling their functions as carriers and combatants of disease? Are not their and our lives in consequence shorter and more painful than need be?

When this reflex is restored to its function, micro-organisms get no farther than the stomach. They are destroyed there by the acid gastric juices stimulated to their full normal secretion by the presence of a sufficiently alkaline substance. Indigestible matter is eliminated, and micro-organisms still existing in the lower intestines, deprived of their means of subsistence, decrease, and in time may cease to exist. The body no longer absorbs the toxins thus produced, and to this fact may be ascribed the increase of mental energy, the general physical betterment, the cessation of morbid cravings for food and drink, and those of a sexual nature which are noticed and experienced. What has just been stated is based not entirely on experimental evidence, but somewhat upon inference. The inference seems justified because the excreta, more especially of the intestines and skin, but also of the kidneys, become almost odorless and entirely inoffensive. The solid egesta are voided thickly covered with mucus, and leave the end of the bowel dry and clean. The sense of cleanliness can only then be appreciated to the full, for it is internal as well as external. Flatus is no longer produced. The urine is inoffensive, and seems to be materially changed in quality, as shown by chemical analysis. Uric acid, chlorides, and more markedly, the aromatic sulphates, are reduced in quantity.

Owing to deliberation in eating, necessitated by this new habit, satiety occurs on the ingestion of considerably less food. By carefully studying one's self, I believe it possible to cultivate an instinct which will regulate, not only the quantity but the quality of food that the body may need. Although there results enhanced pleasure in the taking of all foods, rich and simple, and especially in the appreciation of good wines, the quantities of these foods and beverages that suffice to fully satisfy the appetite is much smaller than formerly, while there is a marked preference for the simpler kinds of food. The writer now can imagine no more pleasurable meal than one consisting of good brown bread, eggs, butter, cheese, and cream. These, with fresh vegetables and a very little fruit, form his staple diet. This tendency and preference for simple foods is the general experience among those who have recovered their reflexes of deglutition.

Following on the ingestion of a lessened quantity of food, and on its better assimilation, there is less waste, the feces are voided less frequently, sometimes only once in five to eight days. The lower bowel is not the reservoir it once was; hemorrhoids cease from troubling, and constipation cannot exist. For this same reason the body, at the beginning of the practice, commences to approximate to its normal weight, increasing or decreasing as the individual is too thin or too stout. Temperature and exercise have an immediate influence on the new appetite, which can now be relied upon, for it has become instinct.

A few more words only must be said. It has been simple to state the result of experiments and observations; but the acquiring of this new reflex while pursuing daily occupations, is not simple, and needs more than a little patience and much serious thought. The habits of a lifetime cannot be changed in a few days or weeks. The shortest time in which the reflex has been re-established is four weeks, and this only by avoiding conversation at mealtimes, and concentrating the attention on keeping the food in the mouth until complete alkaline reduction has taken place and taste has disappeared.

The author finds that he is taking so much less food that, while his mind is open as to his arriving at the final diet of Luigi Cornaro,— said to have been only an egg a day of solid food, and, presumably, some liquid nourishment as well,— yet it is easily conceivable to him that living a similar life of retirement in a placid environment, it would be quite possible to do as he did; hence the title of this paper and the queries at its commencement.

A French Mission to America for the Study of Yellow Fever. — The Chamber of Deputies and the Senate have unanimously voted a sum of 100,000 francs for the organization and expenses of a mission to study yellow fever. The mission will consist of three or four members under the direction of the Pasteur Institute, and will, if possible, commence operations in Brazil. — *The Lancet, Sept. 14, 1901.*

TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

THE PARASITIC THEORY OF CANCER.

BORREL (*Annales de l'Institut Pasteur*, Vol. XV, 1901; *Am. Jour. Med. Sciences*) gives an excellent brief review of the literature on the theory of the parasitic origin of cancer. He divides his work into three stages:—

1. "Parasites," described by Neisser, Darier, and others, and believes that their "parasites" were epithelial cells undergoing special changes.

2. "Parasites" of the type described by Thoma, Sawtchenko, and others. These are intracellular bodies, round, single, or multiple, occurring chiefly with carcinomatous epithelium of glandular type. These bodies show a superficial resemblance to certain stages in the development of coccidia. Borrel believes that these bodies arise from peculiar changes which occur in the attractive sphere and centrosome of carcinoma cells.

3. "Parasites" believed by some men to be blastomycetes. Borrel says that the men who believe in this theory have assumed that all sorts of cell inclusions with a circular outline are blastomycetes, while in fact the inclusions have no morphological likeness to blastomycetes; and the infinite variety of cell inclusions, even in carcinoma, cannot all arise in the same way. The objections to the blastomycetic theory are: the nodules produced in animals by inoculation with blastomycetes are, with the exception of two cases of Sanfelice (cf. infra), of mesoblastic type; most men, with decent asepsis in making cultures, do not obtain cultures of blastomycetes from carcinomata, and there is no evidence that yeasts are found within epithelial cells. Borrel analyzes Sanfelice's two "successful" cases, and decides that there is no evidence that the tumors were due to the action of blastomycetes.

Borrel's own contribution is a demonstration of the fact that bodies morphologically identical with the "parasites" of cancer are produced in normal and carcinomatous cells by certain peculiar changes in the attractive sphere and centrosome. He employs special technique in hardening and staining tissues. In the testicle of guinea-pigs the attractive sphere and the centrosomes of cells which are to become spermatozoa show stages of development in which they resemble the "parasites" seen in cancer cells. In the cells of carcinoma the attractive sphere with included centrosomes may give rise to similar appearances. At times there comes a collection of portions of the sphere about each of several centrosomes, producing appearances like those seen in the "spore cyst" of various believers in the parasitic theory.

Hence, Borrel concludes that the so-called parasites are due to peculiar changes of the attractive sphere about the centrosome. He says that the theory of parasitic cause is attractive, but that at present there is no evidence to support any of the theories.— *Pediatrics, Oct. 1, 1901.*

The Action of Light upon the Skin.— Niels R. Finsen, M. D., discusses this subject in an interesting report (*Meddelelser fra Finsen's Med. Lys. Institut*), which leads to the following conclusions:—

1. I have confirmed the results of Wiedmark's researches on the action of light upon the skin, and further proved that the visible chemical rays also have the power to produce specific photo-chemical inflammation of the skin.

2. I have shown that in the electric light the strongest bactericidal power resides in the ultra-violet rays, and as a practical conclusion, it follows that quartz lenses ought exclusively to be used in electric-light concentrating apparatus; and this alteration (from glass lenses) has immensely advanced the treatment with concentrated light.

3. I have pointed out that the dilatation of the cutaneous vessels produced by the chemical (ultra-violet) rays is of considerable duration, and it has even been possible to show this about half a year after the light's action.

4. Comparsion of the different factors acting on the skin has shown that the normal reddish color which the skin acquires when uncovered, seems, if not exclusively, certainly for the most part, to be produced by the chemical rays; its occurrence seems to be retarded by heat and promoted by cold.

Observations 3 and 4 indicate a great advance in the study of the physiological action of light upon the skin. Whereas formerly it was only a question of acute skin reddening, the pigmentation being considered the principal or sole chronic result of the effect of light, there is now the phenomenon of chronic skin redness also to be attributed to the influence of light.

The reason that this effect has been overlooked is no doubt this — that the pigmentation, being the more conspicuous phenomenon, has exclusively attracted attention, and also that this pigmentation has partly concealed the red color of the skin. On the other hand, in cases where there has been little pigment, and therefore conspicuous skin redness, or where the pigment has disappeared and the skin redness has thus become more evident, the cause was generally attributed to factors other than the chemical rays of light.

We have, therefore, taken a step forward; but the step is not a complete one, as we do not thoroughly know the importance or exact signification of an abundant blood supply to the skin. We are entitled to presume that the skin is better nourished and more able to perform its functions; but what these functions are we do not fully know as yet. Only when we come to have a definite knowledge of these will the importance of the action of light upon the skin be clear, and we will then, without doubt, arrive at the conviction that we have in the chemical rays of light a resource — perhaps the most powerful known to us — whereby (in the form of light baths) we can enhance the functions of the skin.

At the Light Institute, we have, for some time past, but principally with other objects in view, tried the therapeutic use of such photo-chemical light baths (sun baths, electric-light baths). Our experience has, however, been very limited up to the present time, and we are not yet out of the experimental stage. — *Med. Review of Reviews, July 25, 1901.*

HENRY D. BEYEO, M. D., of Philadelphia (*American Medicine*, Sept. 21, 1901), has made careful studies of a large number of cases of floating kidney with other forms of splanchnoptosis in women. In his experience, from ten to fifteen per cent of gynecological patients have floating kidneys producing symptoms, the right kidney being the one usually displaced. He considers the presence of nervousness, pain in the loin, perhaps with indigestion, as a sufficient index for careful study, with necessary repeated physical abdominal examinations for floating kidney, — gastroptosis and enteroptosis. The digestive disturbance is usually chronic, and is accompanied by intestinal fermentation, flatulence, and often by a chronic mucous entercolitis, which he considers a neurosis, a reflected nervous disease extending through Auerbach's or Meissner's plexus. The dragging pain in the loin, extending down to the groin and into the thigh of the affected side, he finds is the most frequent and characteristic symptom, and directly referable to change of position of the mobile kidney. The severity of the nervous symptoms depends upon the degree of mobility of the kidney, and are chiefly restlessness, insomnia, cardiac palpitation, and symptoms of profound nervous exhaustion.

Remarks on Enteroptosis.— M. Einhorn (*New York Medical Record*, April 13, 1901,) includes under the term enteroptosis a descent of several organs of the abdominal cavity; that is, a general tendency of the abdominal organs to prolapse. The corset seems to be an important factor in the causation of these anomalies, but the condition is found in young women who have never worn a corset, and in men. A constitutional weakness has been assumed by several writers, and a weakened condition of the abdominal walls appears to be a primary and most important factor. Although in many instances the weakness of the walls takes its origin in a congenital disposition to this anomaly, there is no doubt that cases are met with in which a congenital factor does not come into play. To the latter category belong those instances of enteroptosis which develop after rather sudden great losses of flesh, no matter what their cause; and also after abrupt changes in the volume of the abdominal cavity. The condition is by far more frequent among women, seventy among men and two hundred and seventy-seven among

women in one series of cases. The patient often complains of a faint feeling or certain weakness after rising. There is considerable fatigue after slight exertion. A feeling of weight is often experienced in the lower half of the abdominal cavity, with a dragging sensation in the epigastric region. Flatulence, constipation, and frequent micturition are very frequent symptoms. These patients are, as a rule, thin and slender; the abdominal walls are flaccid, and the cavity appears to be too commodious for its contents. There is but little rigidity of the abdominal muscles, and when the patient stands, the lower part of the abdomen shows a round protrusion. Gastroptosis can be demonstrated by the splashing sound, inflation of the stomach with gas, and gastrodiaphany. The right kidney, both kidneys, the liver, and the uterus are also often prolapsed. The principal part in the treatment consists in the application of a well-fitting abdominal supporter, ample nutrition, and exercise. Electricity seems to be especially adapted, when administered intragastrically, to cases in which there are manifold functional disturbances of the stomach.

Myasthenia Gravis with Lesions Found in the Thymus Gland and Muscles.—Considerable attention has lately been paid to the condition known as myasthenia gravis, but up to the present time no pathological change has been demonstrated either in the nervous system or the muscles to account for the condition. In the *Neurologisches Centralblatt* for this month, however, there is published, by Laquer and Weigert, a case in which definite changes were found in the muscles. The case is that of a man, aged 30 years, who in 1896 suffered from giddiness, palpitation, and a feeling of weakness after exertion. In 1900 he experienced difficulty in raising the arms, and at the same time had drooping of the right upper eyelid; a few months later there was marked weakness in chewing, and also in the muscles of the larynx; and after prolonged reading aloud the patient became hoarse. The muscular weakness was well shown in the deltoid muscle. After examination of the patient, a severe attack of cardiac failure occurred, from which he was with difficulty revived. After four months, improvement took place, and he returned to work; but in four weeks he again became weak, with difficulty in swallowing, nasal speech, and weakness of the neck and lumbar muscles, so that he could no longer raise himself. The muscles gave the myasthenic reaction. The difficulty in respiration became distressing, owing to the paresis of the diaphragm and intercostals, but the patient remained fully conscious till the time of death.

At the necropsy there was found in the situation of the thymus gland a tumor about five centimeters in length and breadth, and about three centimeters in thickness. It lay in close connection with the pericardium, but did not involve the great veins. From the lungs a tag had become firmly adherent to the tumor. The nervous system and the muscles appeared to the naked eye to be normal. On microscopical examination the tumor was found to consist of small cells, lymphoid cells, which form the chief part of the normal thymus, larger epithelioid cells also normally present in the thymus, and Hassall's bodies. In many of the veins within the tumor the walls were destroyed, and the cells had grown into the lumen; the same appearance was also present in the arteries.

But of most exceptional interest was the condition found in the muscles. In the deltoid and diaphragm it was found that at many points, both in the sheath of the muscles and between the muscle fibers, there was a great invasion of small lymphoid cells, which closely resembled those found in the thymus tumor; and to a lesser extent the larger epithelioid cells were also present. The muscle fibers themselves, however, appeared to be normal. In the heart muscle similar foci of cells were found, but much less than in the skeletal muscles. Nothing abnormal was found in the nerves, spinal cord, or brain. The combination of myasthenia gravis with disease of the thymus is noteworthy; and though the same condition may have been present in other cases, it is hardly likely that such marked changes in the muscles should have escaped the observation of those who have carefully examined these cases microscopically.—*London Lancet, July 20, 1901.*

Arterial Hypertonus. — By arterial sclerosis is meant a condition of fibrous hyperplasia, with diminished elasticity of the coats of the arteries, particularly those of smaller size. There has been some difference of opinion as to whether the morbid process begins in the middle or the internal coat, but in any event it is generally believed that it is the latter that especially suffers. The process may exceptionally be localized to a circumscribed area, but almost invariably it is general in distribution. It is probably dependent upon the presence of irritants in the circulation, acting directly upon the coats of the vessels and indirectly through a like deleterious influence upon the vasa vasorum. As a secondary result, degenerative fibroid changes take place in the viscera and the tissues generally, and in this way physiological senescence and eventual dissolution are brought about. Atheroma, on the other hand, is generally considered a condition of fatty degeneration of the intima of the arteries, with necrosis and ulceration, and which may secondarily be followed by a deposition of calcareous matter.

In addition to the two morbid processes mentioned, Dr. Wm. Russell (*Lancet*, June 1, 1901) describes a third, which he designates arterial hypertonus, and which may occur independently or be associated with the others. In the presence of this condition the normal arterial tone is increased, and the vascular tension may be heightened, with a reduction in lumen and a diminution in the blood-carrying capacity of the vessel, as a result of contraction of the circular muscular fibers of the walls of the arteries. This modification may be detected by a trained and sensitive finger, but it can be more distinctly demonstrated by means of the sphygmograph and the arteriometer. With the aid of the former it can be shown that the artery is in a state of contraction, the swing of the lever being less, the percussion-stroke shorter and less abrupt, the summit tending to be more rounded, and the predicrotic notch less evident, while the arteriometer measures the diameter of the vessel. Arterial hypertonus may occur under many different conditions, probably as a result of the action of toxic substances introduced from without or generated within the body. In the young and the robust it is associated with heightened blood-pressure and a pulse of high tension, while in the aged and the debilitated, when the heart is feeble, it may cause lowering of the blood-pressure and heart failure. If long continued or frequently repeated, arterial hypertonus is likely to be followed by hypertrophy of the muscular walls of the vessel, while the presence of irritants in the blood gives rise to hyperplasia of the subendothelial connective tissue of the intima. The treatment of the condition consists, apart from correction and avoidance, so far as possible, of the etiological factors, in the administration of remedies capable of relaxing muscular spasm, such as the nitrites, with which the iodides, in small doses, may be serviceably conjoined.— *Medical Record, Sept. 14, 1901.*

Sanitary Rules to Govern Barber Shops.— The Health Board of San Francisco, Cal., recently sent the following rules to the supervisors to be adopted as an ordinance, and they will also be submitted to the State Barber Examiners for approval: —

Mugs and shaving brushes shall be sterilized by immersion in boiling water after every separate use thereof.

Razors shall be wiped with alcohol both before and after they have been used.

Hair brushes known as "sanitary brushes" must be used, after first being sterilized.

Razors strops must be kept clean, and never wiped off with the hand or blown upon with the breath.

A separate clean towel shall be used for each person.

Barbers shall not blow away with the breath any hairs after cutting, but use a towel or bulb or hair brush.

Barbers shall keep their finger nails short cut and clean; alum or other material used to stop the flow of blood shall be so used only in powder form, and applied on a towel.

The use of powder-puffs, finger-bowls, and sponges is prohibited.

No person shall be allowed to use any barber shop as a dormitory.

All barbers' instruments must be disinfected after using.

These rules shall be placed in a conspicuous place in the shops.— *American Medicine, Aug. 31, 1901*; *Pediatrics, Oct. 1, 1901.*

Sterilization of the Hands and Puerperal Morbidity. — Statistics presented by Sticher (*Zeit. fur Geb. u. Gyn.*, Bd. xlv., H. 3), including 1,200 cases examined and delivered with sterilized rubber gloves and the same number without gloves, show a practically negligible difference in puerperal morbidity in favor of those handled with gloves. Having, in this group of cases, eliminated as far as possible infection by the examining hand, Sticher concludes that the genital canal is frequently the source of infection. For this reason he advocates a combination of asepsis of the hands and antisepsis of the genitals.—*Am. Jour. of Obst., etc., September, 1901.*

The Value of Hydriatic Measures in the Treatment of Neurasthenics. —Wharton Sinkler, M. D., in a paper read before the Philadelphia County Medical Society, May 8, 1901, and published in the September 15th number of the *Therapeutic Gazette*, recommends the following treatment for neurasthenics : —

"The patient is placed in the hot-air cabinet until perspiration begins. He is then given the circular, or so-called 'needle bath,' for one minute, beginning with a temperature of 95°, and gradually reducing to 85°, with a pressure of twenty pounds. The Scotch douche is then applied to the spine. This consists in the application of an alternate hot douche and cold water at a temperature of 105° and 80°, with a pressure of about twenty pounds. The treatment at first should last for only twenty-five or thirty seconds. After a few days the pressure is increased to twenty-five or thirty pounds, and the extremes of temperature used are much greater, alternating, for example, between 110° and 70°. After about two weeks' treatment, in addition to the circular and the Scotch douche, the fan douche may be used to the body, abdomen, and extremities. The patient's condition should be carefully watched, and if the reaction is not good, it is necessary to go slowly in reducing the temperature and increasing the pressure of the water. It is my custom to have the pulse, temperature, and respiration of the patient taken before and after the bath, and also to have him weighed before and after. After the bath, brisk friction is applied with warm, dry towels, and a few minutes' general surface massage is given. The patient may then be sent out for a short walk. Exercise after the bath is beneficial, as it promotes reaction.

"Hydrotherapy does not agree with all the neurasthenics, and one should watch its effects in each case carefully. In the excitable, nervous, and apprehensive neurasthenic, the condition is often aggravated by the first few applications of hydrotherapy, just as it often is by massage, or any other procedure. If the different forms of the douche produce an unfavorable result, it is then best to begin with the wet pack, sponging the spine with hot water and cold at home, or in the patient's own room, until his confidence is gained."

Changes in the Blood in Intestinal Autointoxication in Animals.— Krasnoff (*Vratch*, Vol. XXII, No. 17) has noted changes in the composition of the blood of animals in intestinal autointoxication which were produced experimentally by artificial stenosis of the large intestine with consequent constipation. He concludes : (1) The number of red blood corpuscles is diminished, maximum, 72.5 per cent; minimum, 15.6 per cent. (2) The white blood cells are either diminished or increased; maximum diminution, 80 per cent; minimum, 10 per cent; maximum increase, 60 per cent; minimum, 10 per cent. (3) The hemoglobin is always diminished. (4) The specific gravity is lowered, but not always in proportion to the decrease in the number of the red blood cells. (5) The amount of iron in the blood is diminished.—*Inter. Med. Mag., September, 1901.*

Prickly Heat.— R. R. H. Moore (*Indian Med. Record*) says that many in Barrackfore have been saved from the inflictions of prickly heat during the hot seasons by the use of fresh cocoanut oil rubbed into the skin. The best time to apply the oil is before the evening's exercise, but there is no reason why it should not be used twice a day, if necessary, about a tablespoonful each time. The oil should be poured into the palm of the hand, and rubbed over the body from the neck to the ankles. Two or three minutes' gentle rubbing is sufficient to cause the oil to be absorbed by the skin.—*Cycl. of Prac. Med., Sept., 1901.*

Muscular Action of Arteries. — A. H. Smith (*N. Y. Medical Journal*, June 1, 1901) states that recent studies seem to show that physiologically the whole arterial tree is only a continuation of the left heart, and therefore is essentially a muscular organ. Each pulsation is produced by a wave of muscular contraction beginning in the auricle, and passing through the ventricle into the aorta and along each subdivision until the capillaries are reached. The importance to the circulation of this muscular action in the vessels can scarcely be overestimated. Its efficacy as an aid to the heart in the propulsion of the blood is evident at once. The mechanism is a delicate one, and liable to be impaired whenever the physical properties of the vascular walls undergo a change. The effect of calcification in destroying the elasticity of the vessel and making its walls rigid, is what we think of first in this connection. The mechanical obstacle which this condition presents to the forward movement of the blood is of the first importance, and this is enhanced when fibrosis of the outer coat is added. In the latter case the innervation to the arterial walls is impaired or cut off at certain points. The resulting impairment of muscular action throws just so much more labor upon the heart, which is compelled to force the blood unaided through the entire round of the circulation. That hypertrophy of the ventricle should follow is only an illustration of a general law proportioning a muscular growth to muscular activity. — *St. Louis Medical Review, July 6, 1901.*

Massage in Chronic Gonorrhea. — A method recently suggested by Mohlan (*Jour. de Méd. de Paris*, Oct. 17, 1900) reports the successful treatment of chronic gonorrhea in 120 cases which had failed to yield to ordinary methods. The method of treatment employed consisted, first, in emptying the urethra and adjacent glands of their secretion by pressing along the urethra, effected by seizing the organ between the thumb and first finger placed close to the perineum, then drawing the fingers toward the glands, making firm and constant pressure against the under surface so as to compress the urethra firmly. [The urethra would be more completely emptied by placing two fingers in the rectum so as to compress the prostatic urethra, and empty the adjacent follicles, as in a massage of the prostate.] The compression is repeated in the manner described from two to four times. The urethra is then thoroughly cleansed by irrigation with one or two quarts of lukewarm sterilized water; a metallic sound of as large size as will easily pass through the anus is then passed, and the massage is repeated, pressure being made against the sound. Repeat two or three times, as before, then repeat the irrigation. It is claimed that a cure may be thus effected in about three weeks, even in the most chronic cases. Sometimes slight inflammatory reaction was noticed; this was perhaps due to too much manipulation. Possibly better results might have been obtained by the employment of very hot urethral irrigation, beginning with water at 104° F., gradually raising the temperature until it is as hot as the patient can endure. It is also well to add common salt to the water in proportion of one to one hundred; the salt should be added before sterilizing.

Infections in Diseases of Women. — A few of the laws given by C. A. L. Reed (*St. Paul Med. Jour.*, June, 1901), which seem to determine the rôle of the infections in diseases of women, may be formulated tentatively as follows: —

1. The epithelial surface of the genital tract in its integrity is an efficient barrier against invasion of the underlying structures by pathogenic micro-organisms that establish parasitic and saprophytic relations to the vagina.

2. The normal cervix and its contained secretions are adequate barriers against invasion of the uterus by pathogenic bacteria that are capable of maintaining a habitat in the vagina.

3. The vagina possesses certain powers of self-disinfection, which work only against the organisms that are at once true parasites and facultative aërobes.

4. Certain pathogenic bacteria — notably the gonococcus of Neisser, the Klebs-Loeffler bacillus, and the oidium albicans — find, in the warmth and moisture of the genital epithelium, conditions favorable to their propagation and to the increase of their virulence whereby the epithelium itself may be destroyed to the extent of losing its protective properties.

5. Pathogenic bacteria, innocuously present in the genital tract, may become virulent when introduced into the underlying structure through a breach in the protective epithelium.

6. Pathogenic bacteria when introduced into previously normal tissues immediately provoke the process called inflammation, the essential phenomenon of which is the speedy deposit and rapid extravascular migration of the leucocytes, which act as phagocytes in preventing the further invasion of the system.

7. Pathogenic bacteria that are not thus overcome by the leucocytes, may enter either the lymphatia or the sanguiniferous circulation, producing secondary phenomena, septicemia, pyemia, and even the death of the patient.—*Monthly Cyclopedia of Prac. Med., August, 1901.*

The Alleged Increase of Cancer in Massachusetts.— From a study by W. F. Whitney (*Boston Med. and Surg. Jour.*, July 18, 1901) of the alleged increase of cancer in Massachusetts one may say that: —

1. If death from cancer should go on at the apparent geometrical rate of increase of the past fifty years, in two and a quarter centuries every person over thirty years of age would die from that disease.

2. This rate is probably only arithmetical at its worst.

3. The increase is probably due to better diagnosis and registration, and until the ratio of deaths over thirty years has reached 8 or 9 per cent, which is shown by autopsies to be the true rate for cancer, it is not justifiable to speak of the increase as inherent in the disease itself.

4. For purposes of comparison with other places or years, a "graphic picture," composed of both the rate and ratio curves, covering the period of over thirty years, divided into decades, is the best.

5. Comparison with other States and countries shows the rate for Massachusetts to be about the same as theirs, with greater variation between the males and females than is the case in Austria, which is remarkable for the correspondence between the two sexes.

6. In distribution in the New England States there is no geographical feature that explains the slight variation, which is easily within the limits of better registration.

7. In the State itself there is a slight increase westward for groups of counties of the same density of population. The most densely populated part of the State, apart from these, shows a little higher rate.— *Monthly Cyclopedia of Prac. Med., August, 1901.*

Infectious Diseases Spread Through the Milk Supply. — G. M. Kober (*American Journal of the Medical Sciences*, Vol. CXXI, No. 5) bases the following conclusions on the study of 330 outbreaks of infectious diseases : —

The number includes 195 epidemics of typhoid fever, in 148 of which the disease prevailed at the farm or dairy. Of the 88 scarlet fever epidemics, 68 showed cases of the malady at the dairy or milk farm. In six instances persons connected with the dairy lodged or visited in infected houses; in seventeen cases the infection was conveyed by persons handling the milk while suffering or recovering from the disease, and in at least ten, by people who acted as nurses while handling the milk. In one instance the cans had been wiped with an infected cloth, and in two cases bottles or cans became infected while left in scarlet fever houses.

Of the 36 diphtheria outbreaks, 13 showed cases at the dairy. In three instances, employees handled the milk while ill with the disease. Two hundred and forty-three epidemics (of 330) were recorded by English authors, 52 by American, 14 by German, 11 by Scandinavian, and 5 each by French and Australian writers. This is probably due to the fact that milk is consumed raw in England and America, but on the Continent it is rarely used without being boiled. — *Archives of Pediatrics, August, 1901.*

The Plague in Cape Colony, South Africa. — Up to June 6, 318 deaths had occurred in Cape Town, South Africa. Of this number, 57 were Europeans, and 159 colored persons. The number of deaths constituted about one half of the total number of cases.

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

The Danysz Bacillus.— Klein and Williams (*Lancet*, Aug. 7, 1901) give an account of some experiments with the Danysz bacillus. Danysz has suggested that this bacillus is capable of producing an acute, fatal, septicemic disease in rats, and that the dead animals would probably constitute a focus for further infection, the disease rapidly spreading and exterminating these animals, or causing them to migrate from their locality.

As the rat has been instrumental in spreading bubonic plague, these facts were thought to be important in preventing the spread and communication of plague to the human subject. The investigations of Klein and Williams demonstrate that the Danysz bacillus showed a high degree of virulence in their laboratory experiments, but with practical tests in a dock warehouse in the port of London, the results were far from satisfactory. They placed a rat, which had died after a subcutaneous injection of septicemic disease, in the warehouse. This animal was not touched by the rats. They also offered dead mice and guinea-pigs, which were rapidly eaten by the rats of the warehouse. The results were entirely negative. They observed that rats kept in captivity were liable to succumb spontaneously. This was found to be the case in twenty-five per cent of the animals, within the first ten days. Therefore they state that this fact should be borne in mind when experiments are performed in the laboratory, and only such animals should be experimented upon as survive after the first week or fortnight of captivity.

The Bacillus Coli Communis in Relation to Cystitis.— In a paper based upon researches conducted on the urine of twenty cases of cystitis, Dr. K. M. Douglas (*Scot. Med. and Surg. Jour.*, February, 1901) supports the observations of many previous writers by the frequency with which he found the bacillus coli communis to all appearance the chief cause of the inflammation. Of the twenty cases dealt with in this paper, fourteen yielded culture of the bacillus coli, not, however, always in pure culture.

The bacillus coli, however, appears to vary very much in its power to cause cystitis for some reasons unknown, for if we accept Guyon's dictum, that without pus there is no cystitis, it must be admitted that the bacillus coli is often present in the urine without causing this result. The conclusions arrived at by the author are as follows: —

1. The bacillus coli communis is met with in the great bulk of cases of cystitis, and in many is apparently the determining cause of the disease.

2. In certain cases the organism is abundantly present during long periods in the bladder under favoring conditions, but without causing cystitis.

3. Certain of the facts lend support to the view that often the bacillus is a supplanter of other forms rather than the initiating cause of the disease.

4. The marked polymorphism and varying pathogenicity of the organism would account for the conflicting opinions held regarding its identity and its rôle of cystitis, and the confusion of nomenclature until recently prevailing.—*Post-Graduate, July, 1901.*

Destruction of Tubercle Bacilli in Fat.— A. Gottstein and H. Michaelis (*Deut. Med. Woch.*, No. 11, 1901) record their experiments with tubercle bacilli. They point out that, although various observers have stated that the bacilli are only killed at a temperature of 100° C., the medium in which they are grown plays a very important part. Tubercle bacilli are encapsuled by a firm layer of wax-like material, which resists the direct action of heat under many conditions. If, however, the bacilli are growing in fat, the action of this layer is much less marked. They find that a temperature of 87° C. is sufficient to destroy the bacilli in fat, and apply this fact to the question of butter and other fat foods. The sterilization of butter containing tubercle bacilli cannot take place without affecting the constitution of the butter. They experimented with oleomargarine, neutral lard, sesamöl, and cotton-seed oil. They took 130 c. cm. of the fluid fat (heated), and applied a heat by means of a water bath of 40° C. To this they

added a portion of a several-weeks-old agar culture of tubercle bacilli. As soon as this was mixed, two guinea-pigs were injected with 0.5 c. cm., and served as control experiments. Both animals died (19 and 53 days after injection respectively), and post-mortem examination showed ample tuberculous lesions. The oil containing bacilli was then brought up to a temperature of 87° C., and kept at this point for an hour. They took 0.5. c. cm. of the oil at the moment that it reached 87°, at 5, 15, 30, 45, and 60 minutes later, and injected it into guinea-pigs, taking precautions that the instruments, etc., remained sterile for each experiment. The two guinea-pigs injected with oil at the moment of reaching 87° died 36 and 91 days respectively later. Neither showed tuberculous lesions. The rest of the thirteen animals injected remained free from tuberculosis. They therefore conclude that 5 minutes' heating of oil containing bacilli tuberculosis to 87° C. is sufficient to sterilize it.—*British Medical Jour., June 29, 1901.*

Primary Action of the Tubercle Bacillus upon the Tissues.—Wechsberg (*Bietrage zur Pathol. Anatomie und zur allgemeinen Pathologie*, Bd. XXIX, No. 2), after a historical sketch of this subject, sums up our present knowledge as follows:—

There are at present two opposed parties, with views more or less sharply contrasted. Upon one side we find Baumgarten and his partisans, and on the other Metchnikoff and his pupils. The two sides agree on recognizing the tubercle bacillus as the agency which produces — either in itself or through its toxins — the irritation which transforms the fixed or migratory connective tissue corpuscles into the epithelioid cells. The differences in the views of the two hostile camps may be stated as follows: Metchnikoff holds that at the onset of tuberculosis, polynuclear leucocytes emigrate from the blood, and overpower the tubercle bacilli, although this phenomenon does not protect the organism in any way. The real antagonist of the bacillus is the macrophagus — a large, mononuclear phagocyte. This corpuscle is said to come from the blood, and to become changed to an epithelioid cell with large nucleus. Baumgarten, on the other hand, denies that the polynuclear leucocyte plays any important part in the process under consideration, and asserts that the epithelioid cell with large nucleus proceeds from a fixed and not a migratory cell.

There can be no doubt of the existence of multiplication of cells at the onset of tuberculous invasion; this is evident from the mitoses which have been seen in this connection.

The problem which calls for solution is this: Does the proliferation of the fixed tissue cells, which we may regard as destined to become epithelioid cells, entail any sort of damage to the tissues interested? This problem was attacked by the author in a series of animal experiments in which the iris and lung were especially studied.

His first conclusion was as follows: The initial of the bacillus is of the nature of an injury to the tissues, in this way—that the old, sessile tissue elements, such as endothelia, alveolar epithelia, iris epithelia, are destroyed; while the adjacent connective tissue intermediate substance, whether collagenous or elastic, is likewise destroyed.

Does the irritation of the bacillus have any formative or productive influence? This question may be answered in the negative. Notwithstanding the number of young connective-tissue cells in the tubercle, little or no connective tissue is formed.

The tubercle bacillus, which destroys by its toxins the adjacent sessile cells and intermediate substance, may then be said to spare the newly formed brood of cells, while preventing any new formation of connective tissue and blood-vessels. These new cells are eventually destroyed by caseation.—*Journal of Tuberculosis, July, 1901.*

The Bacillus of Leprosy.— Barranikow (*British Journal of Dermatology*, March, 1901) has observed that the life history of the bacillus of leprosy is very complicated. Animals are not receptive to the microbe in all its forms of development. In one phase it loses its specific stain (Ziehl-Neelsen method), not only when passed through one per cent of sulphuric acid solution, but when water only is used, although its clinical characteristics remain the same.

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VALUE OF PHYSIOLOGICAL THERAPEUTICS IN THE TREATMENT OF HEMIPLEGIA.

THE public generally are of the opinion that paralytics are incurable, and that about all that can be done for them is to attend to their daily wants, and see that their environment is made as pleasant as possible. Feeling that other attacks will follow sooner or later, they await with expectancy the third and invariably fatal (?) attack, in the firm belief that medical intervention is of no use.

However firmly these ideas may be fixed in the minds of the laity, the medical man who has had experience in the treatment of this class of cases, and who has employed rational measures in their treatment, knows that such opinions are without any reasonable foundation.

Guthrie, in an article appearing in the *Lancet* of Oct. 19, 1901, on the subject, "The Treatment of Hemiplegia," states as follows: —

"Neglect of hemiplegic patients may be attributed to the pessimistic and cynical teaching that those who get well do so without treatment, and those who do not get well derive no benefit from treatment. Neither statement is strictly true. Mild cases may never recover unless treated; and severe cases, unless treated, may go from bad to worse. . . .

"In a severe case of hemiplegia of from six months' to twelve months' duration, or longer, the patient's arm and leg may be quite useless and immobile. He is unable to stand or walk. His joints are fixed, and any attempt to move them causes extreme pain. His shoulder is usually adducted to his side, his elbow and wrist are flexed, his forearm is pronated, and his fingers and thumb are doubled into the palm of his hand. His hip and knee may also be flexed, his thigh adducted, his knee and foot inverted, and his heel drawn up. The muscles are all wasted, and some are shortened and contracted, thus causing the characteristic pose of the limbs, which cannot be overcome; and his reflexes are exaggerated. This is the extreme and incurable state of helplessness at which the sufferer from hemiplegia may arrive. The immobility of the limbs is due (1) to articular adhesions; (2) to motor paralysis leading to muscular atrophy; and (3) to spasticity or spasmodic contraction of the muscles, leading to permanent shortening of the stronger ones. These conditions in an advanced stage are incurable, but I submit that systematic and intelligent treatment from the first would lessen the number of incurable patients, and would alleviate the lot of those not cured.

"The methods of treatment at our disposal are: (1) Passive movements, (2) massage and electricity, (3) re-education of movements by passive and active exercises combined, and (4) mechanotherapeutics.

"*Articular adhesions* frequently cause limitations of movements. They may occur in the elbow, the wrist, the hip, the knee, and the ankle joints, but are most common and are formed earliest in the shoulder, rendering movements of the joints painful if not impossible. . . . Gentle passive movements of each joint should be practiced many times a day from the very first; for adhesions begin to form very early, in the first week or two, during which it is advisable to confine the patient to his bed. When formed, they are difficult to disperse, hence the importance of preventing their occur-

rence or of dealing with them early. Neglected adhesions soon become permanent.

"*Spasticity*, or early rigidity, is noticed on manipulation of the affected limbs or by the patient's voluntary movements of other parts. . . . The early treatment of this condition is as important as is that for the prevention of articular adhesions. Almost from the first the limbs tend to assume the attitude which may afterward become permanent. Therefore, even while the patient is confined to bed, all faulty positions, and any tendency to adopt a particular position, should be corrected. Adduction of the shoulder may be prevented by placing a sandbag in the axilla. The elbow should be kept extended rather than flexed; the tendency to flexion is easily overcome in the early stages. Advantage may be taken of the curious consolation which the patient derives from playing with his paralyzed arm, by instructing him to alter its position himself from time to time with his sound hand. Faulty positions of the lower extremity should be similarly treated. The limb should be rotated outward and abducted, and the foot dorsiflexed and everted in order to obviate the tendency to assume opposite positions. Spasm of the hip flexors is rare, but when it occurs, it may be counteracted by placing a pillow beneath the buttocks. Contraction of the hamstrings should be treated by raising the heel. Sandbags may be used to insure favorable position of the limbs. When the patient leaves his bed, similar precautions should be taken against malposition. He should never be allowed to carry his arm in a sling, but he should keep it dependent as much as possible, only flexing it from time to time, should edema appear. He should not be allowed to sit with his knees and toes turned in, but should be told to correct these positions himself with his sound hand.

"The principles of treatment so far aim at prevention of fixation of joints and faulty positions of limbs.

"*Muscular atrophy* usually occurs sooner or later in hemiplegic limbs. . . . Passive movements, massage, and electricity are useful stimuli. By them we may hope to preserve the nutrition of muscles and neurons alike. If we can do so, it is obvious that the patient will be better able than otherwise to make use of the gradual return of power.

"Passive movements aid as stimuli, as well as in the prevention of articular adhesions.

"*Massage.*— Massage arrests atrophy, promotes muscular growth, prevents edema, improves the circulation of blood and lymph, renders the joint supple, and probably has a direct action on nerves and nerve centers; but massage, unless employed with gentleness and intelligence, does more harm than good. It is useless to leave a masseur who has learned the mysteries of effleurage, pétrissage, and hachage in six easy lessons, to work his will on the patient. . . . The method of massage for improving the tone of individual muscles is pétrissage, or kneading; effleurage, or stroking, promotes general circulation in the limbs. . . . Electricity, whether faradism or galvanism, is a useful adjunct to massage, but cannot take its place. . . .

"*Re-education of Movements.*— So far we have considered the physical causes which impede recovery, and the methods of averting adhesions, late rigidity, and muscular atrophy. It must be admitted that in severe cases treatment at best is palliative. . . . In re-educating the patient, we are helped by a knowledge of the natural order in which recovery occurs. Thus, the leg usually recovers before the arm, the hip and knee before the ankle, the shoulder before the elbow, the elbow before the wrist, while the extensors of the fingers, and expecially the abductors and extensors of the thumb, are the last to be restored. . . .

"*Mechano-therapeutics*, such as weights and pulleys, elastic traction apparatus, etc., are only of use to increase powers already partially regained. The strength of muscles overcome beforehand by contraction of the opponents cannot be improved by increasing their labor.

"*Disordered Association.*— The normal alternate association of leg movements in walking is often impaired and perverted after hemiplegia. The patient may appear to try to move both legs at once. Directly he advances the sound limb, the affected one becomes rigid, and is dragged painfully behind. To lessen the difficulty, he should be taught to advance the unsound leg before the sound, bringing the latter up to the level of the former after each step. He needs to be lightly supported on the paralyzed side by an attendant, otherwise he will not rest on the affected leg for fear of falling. It is desirable to prevent a fall, of course, but the support which is given should be moral rather than physical. For this reason, the help of an attendant is preferable to that of a stick or crutch. The patient, if able to use either implement, is apt to make it a substitute for his weakened leg, instead of an adjuvant.

"*Ataxy.*— Want of precision in movements often follows recovery of both limbs. Exercises on the Frenkel system for the treatment of locomotor ataxia are useful in such cases. . . .

"SUMMARY.

"1. Neglect and want of treatment aggravate severe cases, and retard the recovery of mild cases.

"2. The evils to be foreseen and guarded against are articular adhesions, late rigidity, and muscular atrophy.

"3. Articular adhesions should be prevented by passive movements of each joint from the very first.

"4. Faulty positions of the limbs should be constantly corrected, or they will become chronic.

"5. Contraction of muscles should be treated by endeavors to improve the nutrition of their weaker opponents.

"6. Massage, passive movements, and to a less extent electricity, should be used with this object. These agents not only counteract muscular atrophy from disuse, but probably take the place of normal stimuli, and invigorate the neurons.

"7. The recovery of mild cases may often be hastened by re-education of movements. Want of re-education frequently prevents recovery.

"8. Re-education consists in a combination of active and passive exercises.

"9. Movements should be first encouraged in those parts which naturally tend to recover first.

"10. Inco-ordination and general weakness of limbs which have [not] yet regained power of movement should be treated by exercises and mechanical therapeutics.

"11. It is important to find out what the patient can do, and to make him do it.

"In conclusion, this paper deals with the treatment of hemiplegia as a condition without reference to its cause, for whether the cause be hemorrhage or occlusion of cerebral vessels by embolism or thrombosis, is immaterial. The principles of treatment will be the same, and need not interfere with other measures taken for the relief of the disease which gave rise to the hemiplegia."

C. E. S.

DIGITALIS IN CARDIAC DISEASE.

HARE recently called attention to the fact that the prolonged administration of digitalis may result in "producing cardiac hypertrophy in the normal heart." From this, Hare concludes that "when the drug is given to a man suffering with valvular disease with deficient compensation, it must aid materially in inducing compensatory hypertrophy."

There is another inference to be drawn from the fact stated by Hare, to which it seems worth while to call attention; viz., if digitalis produces cardiac hypertrophy when administered to a normal individual, to what reason can this change be assigned? — Evidently, one only; namely, the increase of the work required of the heart; in other words, contraction of the small arteries. In this fact is found the objection to the use of digitalis. If in the use of digitalis, there were only good effects, with no ill effects, this drug would certainly be a wonderful Godsend to the human race; but unfortunately, digitalis, like many other things, is by no means an unmixed good. Digitalis unquestionably excites cardiac activity, but at the same time it increases the work required of the heart. If digitalis could only increase the energy of the heart without increasing the work demanded of it, it would be a perfect remedy. Alcohol is the converse of digitalis; it lessens the amount of work required of the heart by dilating the peripheral vessels, but at the same time numerous observations have shown that it diminishes the power of the heart.

So digitalis helps, if it helps at all, by exciting the heart to a degree sufficient to overbalance the increase of friction created by the contraction of the small arteries. Alcohol helps, if it helps at all, by lessening the work of the heart to an extent sufficient to overbalance the injury done by lessening the power of the heart to do work. If alcohol could lessen the work required without lessening the capacity of the heart, or if digitalis could increase the power of the heart without increasing the amount of work required of it, it would be a remedy of priceless value; but, unfortunately, not alcohol, digitalis, nor any other drug is capable of rendering this sort of service in cardiac diseases. But there does exist a remedy, the value of which seems to be too little appreciated by the medical profession, probably because so little known; viz., the cold precordial compress, and short cooling applications to the entire surface. The cold precordial compress consists of a cheese-cloth compress wrung out of water at 60°, and placed over the heart, or an ice-bag placed over the heart with a single layer of flannel intervening. The effect of such an application is to cause an increase of blood pressure, not by increasing the work, — digitalis "puts sand on the rails," as suggested by Hare, — but by actually energizing the heart, just as any other portion of the muscular system may be energized by a cold application.

It is one of the characteristic physiological effects of cold to increase muscular energy. A still more powerful effect may be produced by cold friction applied to the whole surface of the body, especially to the arms, legs, and back. Friction may be applied by the hands dipped in cold water, and rubbed upon the surface until the skin is red; or by means of a friction mitt consisting of a mitten made of coarse cloth, which, after being slipped on the hand, is dipped in cold water, and rubbed over the skin until it is red. Care must be taken to wrap the part in a dry towel, and rub it quickly until dry, red, and warm; then another part is taken, and so on, until the whole body is gone over. When used to increase the cardiac tone, the cold precordial compress should not be kept in place more than ten or fifteen minutes at a time; it should then be withdrawn for an hour or more. (Fifteen minutes every two hours is a good prescription.) If the compress is applied, fifteen to twenty minutes three times a day is sufficient.

The following experiments, made in the Hydriatic Laboratory under the author's charge, clearly demonstrate the power of the precordial compress to energize the heart and increase the arterial pressure: —

1. The subject was a young man aged 35; weight, 122 pounds; pulse rate rate, 72. A cold application, consisting of an ice-poultice one foot square, was applied over the heart and left chest. The effect was an immediate increase of the pulse rate to seventy-six for two minutes. The pulse was then slowed, becoming at the end of three minutes seventy-two.

2. The subject was a patient suffering from severe collapse following a prolonged and complicated abdominal operation for the removal of impacted gallstones. Before the application of the compress, the patient's pulse was so weak that it could not be felt at the wrist. When counted by means of the stethoscope placed over the heart, it was found to be over 120. An ice-bag was applied over the heart, with the result that the pulse could be counted at the wrist, the rate was slowed to eighty-seven, and the tension, which was zero as indicated by Gaertner's tonometer, rose to 5 cm.

3. The subject was a young man aged 23; weight, 130 pounds; pulse, 80; tonometer reading, 13. After the application of cold to the precordial region, there was an immediate increase in tension to 17. In two minutes the tension fell to 16, and the pulse to 70. At the end of twenty-five minutes, the pulse was 64, and the tonometer reading, 15.

ALCOHOLIC EXTRACTS.

PROBABLY the majority of practitioners altogether ignore the fact that, in the use of many fluid extracts, the dose administered contains, in addition to the drug held in alcoholic solution, a sufficient amount of alcohol to produce an appreciable effect. At the present time, however, there is a considerable number of intelligent physicians who, through a study of the subject of alcoholic medication, have become convinced that this drug should be discarded from the list of medicinal agents, or at least that it is capable of rendering service only in very exceptional cases. The increase in the number of physicians opposed to the medicinal use of alcohol has led to the investigation of the question whether alcohol is really necessary in the production of fluid extracts, either as a means of extracting the active principle from the crude drug, or for the preservation of the preparation.

Dr. Squibb, the famous New York authority in all matters pharmaceutical, recently read a paper upon this subject before the New York State Medical Association, in which he gave an account of an extensive investigation of this subject, and presented the following statement of facts and observations as having been thoroughly established by his researches: —

"All the alkaloidal drugs are readily and thoroughly exhausted by this agent. From a series of experiments, now somewhat extended, acetic acid does *not* convert the alkaloids present into acetates, but acts simply *as a solvent*.

"As far as experiments now show, in ninety per cent of those drugs which have been successfully exhausted, it is a better solvent than alcohol, producing an extraction more thoroughly representing the drug than was ever accomplished with the alcohol menstruum.

"For the purpose of prescription writing, it is important to realize that all water-soluble salts are soluble in acetic acid, and thus combinations of the acetic fluid extracts with the bromides, iodides, sulphates, and chlorides can be accomplished, and without danger of decomposition.

"The older preparations, which are favored by many (especially the older practitioners), such as the aceta decoctions and infusions, can be safely prepared from the acetic fluid extracts.

"After the experimental stage has been completed and sufficient time allowed to offer finished preparation by settling, the cost of the acetic fluid extracts will be found to be very much less than the officinal alcoholic preparations.

"Another illustration of the advantage to be obtained by the substitution of acetic acid for some of the mineral acids in the already officinal preparations, it may be interesting to mention that an aromatic acetic acid has already been sufficiently tried to establish its superiority over the present officinal aromatic sulphuric acid. This aromatic acetic acid is prepared by simply substituting 99.5 per cent acetic acid for the sulphuric acid in the formula used in preparing the officinal preparation. A vegetable acid is undoubtedly less irritating and more beneficial to the alimentary tract than a mineral acid, and therefore it is claimed that this combination will prove useful in many cases."

REVIEWS.

ESSENTIALS OF OBSTETRICS. — By Charles Jewett, A. M., M. D., Sc. D., Professor of Obstetrics and Gynecology in the Long Island College Hospital, and Obstetrician and Gynecologist to the Hospital, etc. New (2d) edition, revised and enlarged. In one 12mo volume of 376 pages, with 80 engravings and 5 colored plates. Cloth, $2.25 net. Lea Brothers & Co., Publishers, Philadelphia and New York.

The popularity and value of this work is evidenced by the fact that the publication of a second edition has been found necessary in so short a time after the appearance of the first. The present edition has been thoroughly revised, and considerable new matter added.

The author has succeeded in embodying in the work only those facts pertaining to the subject which are of practical importance. The work includes eight chapters, treating of the following subjects: Anatomy of Female Genital Organs; Physiology of Pregnancy; Physiology of Labor; Physiology of the Puerperal State; Pathology of Pregnancy; Pathology of Labor; Pathology of the Puerperal State; Obstetrics and Surgery.

It is well illustrated, and the workmanship of the book is all that could be desired in a work of this size. The book will be of especial value to medical students, and to those who wish to become familiar with the essentials of obstetrics.

THE FOOD VALUE OF MEAT. FLESH FOOD NOT ESSENTIAL TO MENTAL AND PHYSICAL VIGOR.— By W. R. C. Latson, M. D., editor of *Health-Culture*. Illustrated. 72 pages; price, 50 cents; paper, 25 cents. The Health-Culture Co., 481 Fifth Ave., New York.

The matter of meat eating is becoming an important subject for consideration. The greatly increased cost, attributed to the "Meat Trust," and the question of the quality of meat products as now produced, bring the subject to the attention of the people in a very practical way. If physical and mental vigor can be maintained without the use of flesh food, then many people would greatly prefer to lessen the amount used, if not to abstain from it altogether. In this manual Dr. Latson considers the matter fairly, and shows quite clearly that all the food elements found in meat can be obtained by the use of other products, as cereals, nuts, vegetables, fruits, etc., avoiding the use of foods that in and of themselves are likely to be unhealthful.

The author calls attention to the fact that in the animal body there is a constant breaking down of tissue, which becomes waste matter. The flesh of the animal is laden with this poisonous waste, and this, taken into the human body, is a frequent cause of weakness and disease.

The subject is presented in a simple and practical way, and many other interesting and valuable facts are given by the author. The booklet can certainly be commended to the thoughtful reader who is interested.

A LABORATORY HANDBOOK OF PHYSIOLOGIC CHEMISTRY AND URINE EXAMINATION. — By Charles G. L. Wolf, M. D., New York. 204 pages, 47 illustrations; size, 12mo; price, $1.25 net.

ATLAS OF BACTERIOLOGY (two volumes). — By Drs. J. H. Lehmann and R. O. Neumann. Volume I contains 69 full-page, beautifully colored plates; Volume II contains more than 500 pages of text. Price, $5 per set. This work is sold in sets only.

A SCIENTIFIC BASIS FOR MEDICINE; LIFE AND ITS ASSOCIATION WITH MATTER: MATTER NOT VITAL BUT ABSOLUTELY CHEMICAL. — By E. C. Hebbard, M. D., Boston, Mass., Member Massachusetts Medical Society. Reprinted from the *Medical Times*, February and March, 1901.

The Battle Creek Sanitarium

LABORATORY OF HYGIENE.

J. H. KELLOGG, M. D., Superintendent.
F. J. OTIS, M. D., Bacteriologist.
HOWARD RAND, M. D., Urinalist.
NEWTON EVANS, M. D., Pathologist.
ELMER L. EGGLESTON, M. D., Chemist.

Monthly Résumé of Work Done.

REPORTS OF EXAMINATIONS FOR OCTOBER.

Gastric.—

	Hyperpepsia.		Simple Dysp.		Hypopepsia.		Total.	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Without bacteria	34	100	8	100	99	88	141	91.5
Less than 10,000 bac.					1	1	1	.5
Between 10,000 and 100,000 bac					6	5.5	6	.4
More than 100,000 bac.					6	5.5	6	.4
Total	34	100	8	100	112	100	154	100

The patients were received from the following States and countries: Michigan, 33; Illinois, 22; Ohio, 20; Indiana, 19; Minnesota, 5; Pennsylvania, 4; Mississippi, 4; Wisconsin, 4; New York 4; Missouri, 4; Kentucky, 3; West Virginia, 3; Iowa, 3; South Carolina, 2; Tennessee, 2; District of Columbia, 2; Louisiana, 2; Massachusetts, 1; Arkansas, 1; Colorado, 1; Arizona, 1; New Jersey, 1; Florida, 1; Indian Territory, 1; Montana, 1; Texas, 1; Kansas, 1; Australia, 1; Japan, 1; South America, 1.

Sputum.— There were 31 examinations made, 30 of which were new cases. Tubercle bacilli were found in 6 cases.

Blood.—

Hemoglobin.	Men.	Women.	Total.
108 per cent	1		1
107 " "	1		1
106 " "	2		2
105 " "	6		6
104 " "	7	2	9
103 " "	1		1
102 " "	10	4	14
101 " "	13	6	19
100 " "	15	6	21
99 " "	4	1	5
98 " "	16	6	22
97 " "	9	9	18
96 " "	12	8	20
95 " "	5	9	14
94 " "	1	5	6
93 " "	6	4	10
92 " "	4	9	13
91 " "	6	3	9
90 " "	3	10	13
89 " "	2	1	3
88 " "	4	5	9
87 " "	5	5	10
86 " "	2	3	5
85 " "	3	7	10
84 " "	2	3	5
83 " "	1	5	6
82 " "	1	5	6
81 " "		2	2
80 " "	3	5	8
79 " "	4		4
77 " "	1		1
76 " "		2	2
75 " "	1		1
73 " "	1		1
72 " "	1	1	2
71 " "	1		1
70 " "		4	4
68 " "		2	2
67 " "		1	1
66 " "	1	1	2
65 " "		1	1
63 " "	1	2	3
62 " "		1	1
60 " "		2	2
58 " "		1	1
55 " "	4		4
54 " "	1	1	2
53 " "	1	1	2
50 " "	1		1
48 " "		2	2
Total	163	146	309

Blood Count.	Men.	Women.	Total.
5,000,000 and over per cu. mm	80	57	137
4,500,000 and 5,000,000	39	35	74
4,000,000 " 4,500,000	20	25	45
3,500,000 " 4,000,000	16	19	35
3,000,000 " 3,500,000	5	7	12
2,500,000 " 3,000,000	3	2	5
Below 2,500,000		1	1
Total	163	146	309

Urine.—Total number of cases examined, 714; total number of new cases, 319; total number of cases having albumen, 44; sugar 10; casts, 15; pus, 76; blood, 4; bile, 1.

MODERN MEDICINE

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ORIGINAL ARTICLES.

THE PRACTICAL APPLICATION OF HYDROTHERAPY IN GYNECOLOGY.[1]

BY J. H. KELLOGG, M. D.,

Superintendent of the Battle Creek (Mich.) Sanitarium.

THERE is perhaps no department of medicine, with the exception of surgery and the eye and ear specialties, which rests upon so thoroughly a rational basis as does modern gynecology. If the scientific measures which modern medical progress has placed in the hands of the medical profession are not always utilized in the treatment of this class of disorders, it is not because they do not exist, but in many cases because of the lack of facilities for their employment, and possibly there may be also, in some instances, a lack of appreciation of their value. Clinical experience certainly shows that the physiological measures which may be brought to bear in the treatment of this class of maladies are of the highest value, and are capable of accomplishing far more in nonsurgical cases than any or all remedies.

The measures which are chiefly relied upon in gynecological treatment may be briefly stated as surgical, germicidal drugs, and measures for establishing asepsis, mechanical appliances for overcoming static disorders of the pelvic and abdominal viscera, electricity, systematic exercise, manual Swedish movements, massage, and last, but not least, hydriatic processes.

A few simple hydriatic measures, especially vaginal irrigation, the fomentation, and the ice-bag, are almost universally employed in gynecological practice. One purpose of this paper is to call attention to a score or more of other equally valuable hydriatic procedures which, while for the most part not new to the profession, are less generally well known, and in practice are almost wholly confined to a few medical establishments. I wish also to call attention to two or three new procedures, which are the outgrowth of my personal experience, and which I have found very valuable, especially in the treatment of inflammatory affections of the pelvic viscera.

A very great advantage presented by hydriatic procedures in gynecological practice is the fact that those procedures which are most essential may be utilized anywhere. A few cotton sheets, two or three blankets, a few towels and flannel cloths, with hot and cold water in requisite quantity, are the only things really essential for hydriatic applications, which may be the means of relieving most excruciating pain, and perhaps of saving life.

The greater share of curable pelvic disorders from which women especially suffer may be roughly classified as neuralgic, inflammatory, and static. Neuralgic affections of the ovaries and uterus must in general be looked upon as not strictly local disorders, but simply local expressions of a general morbid condition manifested at the point of least resistance of an irritation existing at some reflexly related part. Pelvic, like other inflammations, are for the most part due to the infection occurring either from without through the vaginal canal, or from within by the migration of infectious elements from the alimentary canal. This local infection is evidence of a local lowering of the vital resistance, due either to traumatism or some other equally efficient cause.

Static disturbances owe their origin in the great majority of cases, as I undertook to demonstrate in a paper presented at the Periodical Gynecological Congress

[1] Read before the Michigan State Medical Association held at Battle Creek, May 15 and 16, 1901.

held in Brussels in 1892, to the deficient development of the muscles of the trunk, especially to weakness of the abdominal muscles.

Neuralgia affecting the pelvic viscera is usually due either to inflammation, some static disturbance, a displacement of a pelvic viscus or enteroptosis. In a paper read at the Washington meeting of the American Medical Association in May, 1891, I showed by the statistics of several hundred cases, the intimate association between pelvic and abdominal displacement, and Glenard, Trastour, and others have shown the extended reflex disturbances arising from these visceral displacements. In a very limited number of cases, the neuralgia of the pelvic viscera is due to a general neurotic state. In each of these several classes of disorders, comprising almost the entire list of gynecological affections, hydrotherapy presents one of the most efficient classes of therapeutic measures, both palliative and curative.

In the majority of cases needing gynecological treatment, the patients require general tonic and restorative measures. Neurasthenia in some form is very commonly present. Anemia is also an exceedingly common condition. As a means of producing general restorative, alterative, and tonic effects, hydriatic measures, properly employed, stand unrivaled. Cold water is a tonic measure superior to every other means known for producing prompt and permanent effects. By careful graduation, the restorative excitant effects of cold may be utilized even in the very feeblest cases, and may be adapted to those requiring the most powerful excitation of the central ganglia.

The following is a sort of ascending scale, or hydriatic ladder, so to speak, up which the chronic gynecological invalid may be safely led, without at any time producing injurious shock or discouraging symptoms of overtreatment:—

1. *Wet Hand Rubbing.*— In extremely feeble patients, apply to the back only; then from day to day, increase the area, adding chest, arms, and lower legs; then cover arms, chest, back, and entire legs; finally the entire surface. Begin the application with water at 65° or even 70°, and lower the temperature one or two degrees daily to 40° or even 34°.

2. *Cold Mitten Friction.*— Begin with water at 60°, dipping once only; lower the temperature one or two degrees daily to 40°; then gradually increase the number of dips from one to four.

3. *Cold Towel Rub.*— Begin at 65°; lower the temperature one or two degrees daily to 40°. Wring towel at first very dry. Wring less from day to day until saturated towel is used.

4. *Wet Sheet Rub.*— At first wring the sheet very dry in water at 65°. Lower the temperature one degree daily to 35°; wring the sheet less dry at each application until a saturated sheet is used.

5. *Dripping Sheet.*— The same as the preceding until rubbing is completed; then, the sheet being well warmed, a pail of water five degrees lower than the water in which the sheet was wet, is poured over the patient, and the rubbing renewed. This may be repeated three or four times.

6. *Shallow Bath.*— Begin at 75°; lower the temperature two degrees daily to 60°. Duration at first one-half minute, gradually increasing to three minutes.

7. *Pail Douche.*— Begin at 75°; lower the temperature two degrees daily to 60°; at first two pails only, and gradually increase to six.

8. *Cold Douche.*— Horizontal jet or spray; temperature 70° to 50° F. Precede by warm shower. Lower the temperature one degree daily, increasing the pressure; the duration is also increased from 10 seconds to 15 or 20 seconds. Percussion douche to spine when possible.

In certain cases most powerful sedative effects are required. Here, likewise, the superior value of hydriatic applications clearly appears in relieving more efficiently than can any drug or other measure which may be safely and continuously employed, either general or local irritability.

The Rationale.— For producing local effects in the treatment of diseased conditions of the pelvic viscera, several of the great general principles upon which hydrotherapy is based are constantly utilized. The first of these depends upon the interesting anatomical fact that the skin overlying a deeply seated internal part is reflexly connected therewith in such a way that when the surface vessels are made to contract by the application of a stimulus, the same condition is produced in the associated internal viscus. For example, the application of cold water to the hypogastrium, or the skin overlying the bladder, causes a contraction of the vessels of the area with which the cold water

is brought in contact, while at the same time producing a contraction of the bladder and of the blood vessels distributed in the walls of the bladder. Every person is familiar with the fact that cold water applied to the general surface, or even to the feet, gives rise to prompt and often very vigorous contraction of the bladder. The same effect is likewise felt upon the other hollow viscera, as the uterus, large and small intestines, and the stomach. All involuntary muscular fiber is stimulated by these cutaneous applications. The skin areas which are of special importance in this relation are the skin covering the lower lumbar and sacral regions, the buttocks, the hypogastrium, the inner surface of the upper portion of the thighs, the external genitals, and the perineum. Several of these surfaces are quite likely to be neglected in the employment of other measures than immersions. The purpose of thermic applications to these surfaces is chiefly to control the circulation in such of the pelvic viscera as may be of value in a given case. By such applications, made with scientific discrimination and precision, it is possible to control, almost at will, the volume of blood in the pelvic viscera, and the movement of blood through the parts. Glandular and other forms of functional activity may likewise be controlled to a marvelous extent.

In cases of general inflammatory processes involving the pelvic region, we have a valuable resource in the cold compress applied to the hypogastrium, to the pudenda, and the inner surface of the thighs. The compress for this purpose should be wrung out of water at 60°, and should be changed once in fifteen minutes. Slight reaction should occur before the compress is changed; that is, the compress should become warmed a little so that the sensibility of the skin may be maintained. If the cold application is so intense as to benumb the surface to which the application is made, the reflex excitation will be diminished, and the blood vessels of the associated viscera will not be stimulated to contract; in fact, the very opposite effect may be produced. If it is desired to confine the antiphlogistic effect to a circumscribed area, as to an ovary, the uterus, or an inflamed tube, the compress will be made correspondingly smaller, and will cover only the area of skin lying above the diseased part. A cold compress six inches square, for example, is amply large to influence an inflamed ovary. A compress twice as large is needed for a diseased tube. Too large compresses must be avoided on account of the retrostasis.

Still another very important principle must be understood in order to enable one to make really scientific applications of hydriatic measures in these cases. This is the principle of fluxion. When a cold application is made to the whole surface of the body, all the internal organs are thereby congested — after the first momentary contraction of their vessels has passed away — by the mechanical displacement of the skin inward, or retrostasis. During the first instant after the general cold application, while the internal organs are contracted, the surplus blood chased out of the systemic circulation, finds temporary refuge, so to speak, in the veins of the portal reservoir, from which, in the later moments, it is redistributed among the internal organs. When the cold application is partial, however, this general retrostasis of blood does not occur except to a very limited extent, a very different readjustment of the blood distribution taking place.

Where all the parts concerned are supplied by a common arterial trunk, reciprocal changes in the volume of blood occur between the superficial and the deeper parts. This relation exists between any muscle, joint, or bone, and the overlying cutaneous area. It also exists between the overlying skin and the brain, the spinal cord, the eyes, the ears, the serous lining of the pleural and peritoneal cavities, the lungs, the kidneys, the uterus and the ovaries in woman, the testicle and prostate in man. This relation between the skin and the uterus, ovaries, kidneys, bladder, and lungs, is less intimate than between the muscles and joints; but clinical results as well as anatomical considerations indicate that such relation does exist, though more remote, and it is even possible to trace a very distinct and direct anatomical connection between the blood vessels of the liver, stomach, intestines, spleen, pancreas, and the contiguous superficial parts.

If, in illustration of this principle, we apply a cold compress over a fleshy part, as the front of the thigh, the result will be the production of pronounced anemia of the skin and a corresponding hyperemia of

the underlying quadriceps extensor femoris muscle. If, on the other hand, a hot compress or fomentation be applied instead, the result will be the diversion of blood to the skin and the production of anemia of the muscle. This principle is illustrated in Figs. 1 and 2. In Fig. 1, the vessels are supposed to be in a normal condition. In Fig. 2, a condition of hyperemia of the skin has been established by means of a fomentation, producing collateral anema of the underlying parts.

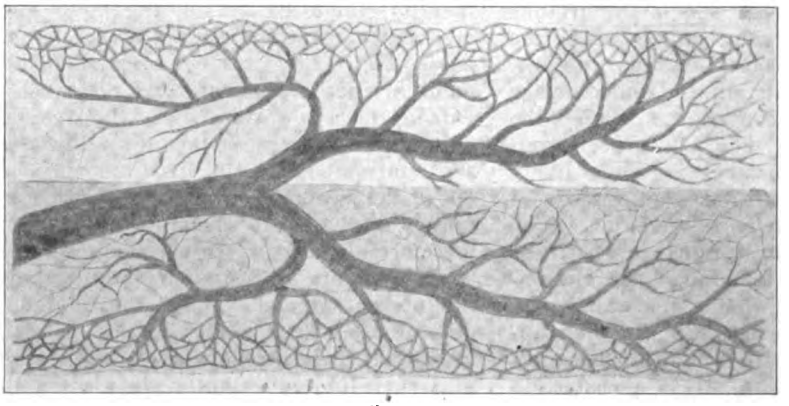

FIG. 1.

It is an interesting anatomical fact that the skin covering the pelvis is chiefly supplied with blood from the internal branch of the common iliac artery, which also supplies blood to the uterus, ovaries, and other pelvic viscera. The external branch of the iliac gives off to the pelvis only a few small vessels, going to form the femoral which supplies the leg. We thus have two most admirable means of draining the pelvic viscera in case of congestion of these organs. By hot applications made to the legs, the external branch of the common iliac may be dilated, thus diverting the blood from the internal iliac and all its branches, both internal and external. By a hot application made over the lower abdomen, or better still, about the hips by means of a hot hip pack, for example, the internal branches of the internal iliac may be still further drained by diverting blood into the superficial branches of this artery. By wrapping the hips and legs in a blanket wrung out of hot water,—a hot hip and leg pack,—we may thus produce a powerful derivative effect in favor of the pelvic viscera. The skin covering the hips, legs, and hypogastrium constitutes a reservoir into which the pelvic vessels may be drained.

By combining the two principles of fluxion and reflex action, we may produce still more powerful effects. For example, by the application of an ice-bag over an inflamed ovary at the same time that a hot hip and leg pack is applied, we may secure reflex contraction of the vessels of the ovary, while at the same time we are draining the blood away into the surface vessels. This combination of reflex and fluxion effects, the writer has found exceedingly valuable in the treatment of all forms of pelvic inflammations. The writer was first led to make this application by a study of the anatomical relations of the cutaneous and visceral blood vessels of the lower half of the body. In a great number of cases in which this procedure has been employed, it has rarely failed to produce the excellent results expected of it, and has often wrought results that seemed

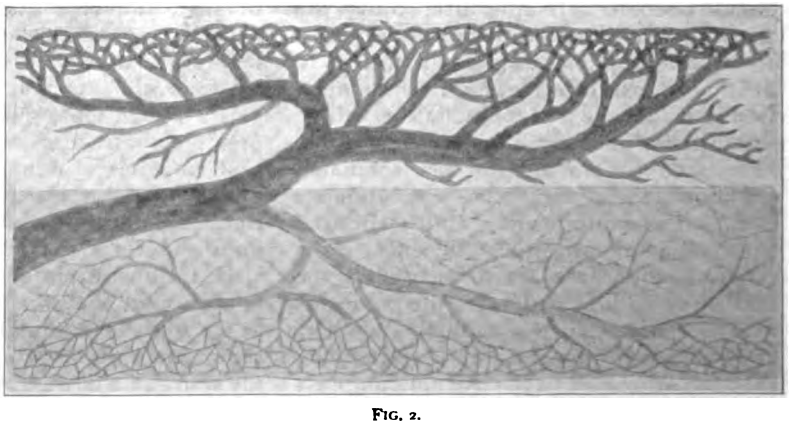

FIG. 2.

little short of miraculous in cases of pelvic inflammation.

The following is a brief description of the hydriatic measures which I have found most effective in gynecological practice, and of the several indications to which they are adapted: —

Lumbar Douche.— The broken percussion or fan douche applied to the lumbar region, with full pressure except in painful affections. The very short douche to the lumbar region, administered with considerable pressure and at a low temperature, is especially useful in amenorrhea. The Scotch lumbar douche (hot applications one to four minutes, cold applications three to thirty seconds) is a most excellent remedy in neuralgia of the uterus and ovaries.

Hypogastric Douche.— The patient sits upon a stool with knees separated, head erect, and trunk inclined backward, while the broken jet, the fan, or the spray douche is applied to the hypogastric region. The cold hypogastric douche continued for one-half minute to a minute produces contraction of the vessels of the uterus, and is hence valuable in both active and passive congestion of the uterus and in all the chronic morbid conditions of the pelvic viscera in which congestion is a prominent factor, such as so-called chronic inflammation of the uterus, and endometritis, also subinvolution and displacements due to relaxation of the supporting structures. The revulsive Scotch douche to the hips, legs, and hypogastrium promptly relieves neuralgia of the uterus and ovaries, vaginismus, and uterine pain due to contraction of the cervix.

The Genitourinary Douche.—In this form of douche the stream of water is allowed to fall first upon the feet, then upon the lumbar region, then upon the inside of the thighs, and finally upon the breasts and hypogastrium. The short cold genitourinary douche is applicable in amenorrhea, subinvolution, and uterine deviations. The very hot genitourinary douche is to be employed in vaginismus coccygodynia, and in ovarian and uterine neuralgia.

Sitz Bath.— The tub may be of metal, porcelain, or wood, of such form and size that the patient may be comfortably seated by leaving the feet outside and flexing the limbs, the feet being placed in a separate and smaller tub during the application. The cool sitz bath, ten to fifteen minutes' duration, is indicated in chronic uterine affections, accompanied by a relaxed condition of the vessels, ligaments, and muscles; also in chronic menorrhagia when not due to vegetations of the endometrium, in pelvic congestion in connection with and following the vaginal douche; also in chronic metritis and circumuterine inflammation. The hot foot bath should be administered simultaneously.

The revulsive sitz, which consists of a very hot sitz at 115° to 120° for five minutes, followed by an affusion of cold water for a few seconds, is a powerful sedative in painful affections of the pelvic viscera, and may be advantageously employed in cases of ovarian or uterine neuralgia. The very hot sitz bath of 106° to 120° for three to ten minutes is of great value in vaginismus, neuralgia of the ovaries, and in painful affections of non-inflammatory character. For the neutral sitz, a temperature of 92° to 97° is employed, duration fifteen minutes to an hour or two. This is an exceedingly useful means for relieving nervous irritability and congestion of the pelvic viscera, and painful and inflammatory affections of the genitourinary organs; also in pruritus and subacute inflammation of the uterus, ovaries, and tubes.

Vaginal Irrigation.— Hot vaginal irrigation is indicated for the relief of pain, to promote the absorption of exudates, and to stimulate vascular activity in the case of salpingitis; also chronic metritis, ovaritis, and so-called endometritis. Very hot irrigation at 125° to 130° is of high value in the checking of hemorrhage. Vaginal irrigation at 90° is useful in relieving pelvic congestions, and at a temperature of 75° to 80° often produces excellent antiphlogistic results where hot irrigation would not be tolerated.

Rectal Irrigation.— Hot rectal irrigation is useful in congestion of the pelvic viscera, and is preferred by Reclus to vaginal irrigation for this purpose.

Hot Foot Bath.— Temperature of 104° to 122°, duration five minutes to one-half hour, completed by a dash of cold water over the feet. Extremely useful in restoring suspended menstruation, and in relieving pelvic pain.

Leg Bath.— Essentially the same as the foot bath, except that a deeper tub is used, and a larger amount of water.

Especially serviceable in dysmenorrhea and suspension of menstruation, ovarian congestion, and pelvic pain from any cause.

Hot Hip Pack.— Hot hip pack, consisting of a folded woolen blanket wrung from hot water, and applied about the body from the umbilicus to the middle of the thighs, covered by several folds of dry blanket. Especially useful in relieving menstrual pains of either uterine or ovarian origin.

Pelvic Pack.— The cold wet-sheet pelvic pack is most useful in chronic pelvic disease when neither active inflammation, acute congestion, nor pain is present. It is also of great service in uterine and ovarian prolapse, amenorrhea, and irregularities of menstruation. The hot pelvic pack is of special service in chronic passive congestion of the pelvic viscera, chronic metritis, chronic ovarian congestion, amenorrhea from arrested development, excessive involution after childbirth. The repeated pelvic pack, employing water at 60° to 70°, changing every thirty to forty minutes, is of great value in non-suppurating inflammations of the ovaries and tubes, pelvic peritonitis, acute metritis and vaginitis. A hot leg pack is employed at the same time. The hot leg pack is a useful analgesic measure in all affections of the pelvis, and renders the highest service in cases of dysmenorrhea, ovarian neuralgia, and in all neuralgic affections of the pelvic viscera. The hot-and-cold pelvic pack renders special service in cases in which the combined influence of hot and cold is desirable. It may consist of a hot pelvic pack, with an ice-bag over the inflamed part, or of a cold pelvic pack with a hot bag over the part.

Revulsive Compress. — The revulsive compress to the hypogastrium, consisting of a hot application for four to five minutes, followed instantly by a cold compress for twenty to thirty seconds, is of special service in all neuralgic and painful affections of the pelvic viscera, and is a decongestant.

Ice-Bag.— The ice-bag applied to the hypogastrium, in combination with the fomentation, or a hot hip pack, or a hot pelvic pack, is especially valuable in acute inflammation of the uterus, tubes, and bladder, and in pelvic peritonitis.

Vaginal applications of dry heat may be made by passing hot water through a hard rubber instrument inserted into the vagina; through which the water is allowed to pass by means of an inflow and outflow connection. Especially useful in relieving painful affections, particularly after a laparotomy involving the pelvic viscera.

In the treatment of individual cases it is often necessary to combine a variety of measures, each modified to suit the special conditions present. I will conclude this paper with a brief outline of the measures which I am accustomed to employ in dealing with some of the most common disorders encountered in gynecological practice.

Acute congestions and inflammations require the application of powerful derivative and revulsive measures, whereby collateral hyperemia of the skin may be produced in favor of the pelvic viscera. Among the best measures for this purpose are the following: Short hot hip pack, five to ten minutes, followed by cold friction ten to fifteen seconds, and a dry hip pack, to encourage the surface circulation. Care should be taken that the feet and legs are warmed. The hot douche (115° to 120°) applied to the same parts for two or three minutes, followed by a cold douche (60°) for fifteen seconds, with vigorous rubbing, is also useful. The latter measure should be employed only in cases of subacute inflammation or congestion, in which the patients are able to stand on their feet for at least a few moments; hot fomentations to the lower abdomen and the pudenda, and in the inner surfaces of the thighs, followed by a short cold compress, consisting of a towel wrung out of water at 60°, applied for thirty seconds. The parts should be rubbed dry, and kept warm by the prolonged application of dry heat, or a hot fomentation for two or three hours if necessary. A cold compress may be applied for half a minute every fifteen or twenty minutes. This measure is especially applicable to cases in which severe pain is a prominent symptom. If the pain is prolonged after a hot application, it should be immediately removed, and a cold compress or an ice-bag substituted for it. When the parts are sensitive to pressure, the weight of the ice-bag may be supported by a string or cord properly adjusted above the body. The cold compress should be changed every five or ten minutes, and should be replaced by the

neating compress for ten or fifteen minutes at least once in two hours. Fomentations to relieve congestion and deep-seated inflammation or pain must be applied as hot as can be borne. The temperature should be sufficiently high to produce a slight degree of pain.

The hot vaginal irrigation (104° to 108°) should be used in internal inflammations. The duration of the application should be fifteen to twenty minutes, and the irrigation may be repeated as often as once in two or three hours, if necessary, or two or three times a day. Care should be taken to avoid using too great pressure by raising the fountain too high. It is also important to avoid a too high temperature. Max Runge showed that very high temperature produces paralysis of the uterine vessels, which persists some time after the application. This is true if the temperature is above 104°. The water in the fountain may have a higher temperature to provide for cooling while passing through the long tube. The actual temperature of the application may be determined by allowing the water to run through the tube for a moment until the tube is warmed, then letting the stream fall upon the bulb of the thermometer until the mercury ceases to rise. The temperature thus indicated should be 104° to 108°. Short applications of a higher temperature may be used when the analgesic effects of very hot water are required. In some cases of hyperesthesia, however, pain will be better relieved by water at a temperature of 98° to 100° than by the application of a higher temperature.

In certain cases, hot rectal irrigation affords greater relief than vaginal irrigation. The reason is that by this plan a larger portion of the affected area may be reached. Short applications and greatly prolonged, very hot applications should be carefully avoided in cases of pelvic inflammation, for the reason that short cold applications increase reaction and the activity of the inflammatory process, whereas prolonged hot applications, by elevating the temperature of the parts, likewise increase the intensity of the disease.

For simple pain or neuralgia of the pelvic viscera, the best measures are general prolonged hot applications, as fomentations to the hypogastrium and pudenda, the hot pelvic pack, and the hot sitz bath, (115° to 120°, five to eight minutes), the temperature being gradually raised from 100° to the maximum degree of tolerance. At the end of the hot application, the part should be quickly rubbed with cold water, or the cold friction with a towel rub may be applied, or a cold compress (60°) for twenty to thirty seconds.

After the hot sitz bath, water at 60° may be dashed over the hips, or the parts may be quickly rubbed with the hand or a friction mitt dipped in cold water. Nearly all pelvic pains, when not due to inflammatory processes, may be promptly relieved by some one or the other of the above-mentioned measures. In some instances, the pain is best relieved by the hot immersion bath or the hot blanket pack, by means of which a larger cutaneous area is brought under the influence of heat, so that very extensive collateral hyperemia is produced, with powerful derivative effects upon the congested parts.

For relaxed or atonic conditions, so-called chronic inflammation, such as a chronic uterine catarrh, chronic congestion of the uterus, rectocele, cystocele, the various uterine displacements, amenorrhea, and certain cases of senile and infantile uterus, and other cases connected with deficient development, the cold or cool sitz bath is employed. For amenorrhea, employ a short cold application, temperature 65° to 75°, duration one to three minutes. Vigorous rubbing of the hips should be applied constantly during the bath. The purpose of this bath is to produce vigorous fluxion of the blood supply of the internal viscera, which it is designed to influence.

The other conditions mentioned require longer applications of the cold bath, and at a temperature somewhat higher (75° to 80°). The purpose is to concentrate the blood in the internal viscera by producing collateral anemia of the skin. Gentle rubbing should be applied occasionally, just sufficient to prevent the patient from becoming chilled. The duration of the bath should be from ten to twenty minutes. The effect should be to produce a sensation of lightness, relief of the various dragging sensations, feeling of weight and pelvic pain, and the stimulation of reparative efforts in the affected parts. It is the blood that heals, as the writer has frequently had occasion to remark before. By concentration of the blood in a diseased viscus, or by in-

creasing the movement of blood through a part, more may be accomplished than by the application of any other known means.

When irritable conditions, as of the bladder or the ovaries, are associated with a relaxed or atonic state of other parts, the cold sitz bath is contraindicated, the cool or neutral sitz or the tonic pelvic pack being employed instead. The fomentation applied to the hypogastrium for ten or fifteen minutes before the pelvic pack, secures power to react, and prevents the ovarian or uterine pain which the cold sitz is likely to induce. In place of the fomentation, the hot and cold pelvic compress may be used with advantage.

In cases in which reaction does not quickly occur, the patient may take a hot sitz bath for one minute, temperature 110° to 120°, just before entering the pack, or the cold friction may be applied to the hypogastrium or the lower back and hips until the parts are reddened. The cold douche to the hips, legs, and lower spine, and the broken douche over the hypogastrium, is likewise an excellent procedure in these cases. When employed for the relief of amenorrhea, to relieve a reflex spasm of the uterine vessels, or to congest the internal vessels, the application should be short, five to fifteen seconds, and the temperature low, (50° to 60°), pressure, thirty to forty pounds. When the purpose is simply to induce active movement of blood through the viscera without suppressing congestion, and to excite the muscular and nerve tone of the parts, the application may be longer, as forty to sixty minutes, the temperature higher, (68° to 75°), and the pressure moderate, fifteen to twenty-five pounds.

In the treatment of gynecological cases, it must not be forgotten that the pelvic disorder is rarely the only disease from which the patient is suffering, and that in many cases it is a secondary rather than a primary disease. The general disorder may be anemia, chlorosis, uric-acid diathesis, neurasthenia, some form of dyspepsia, or general feebleness, etc. Enteroptosis, which is exceedingly common, existing in fully half the cases requiring gynecological treatment, according to the author's experience, requires the abdominal supporter, special and general massage, and other measures necessary for the cure of this affection. It is especially important to give attention to gastrointestinal disorders, particularly constipation, and to give particular attention to the dietary of the patient. Building up of the general health so as to secure gain in flesh and blood will accomplish more in the majority of cases than any other local measures without such general improvement.

(To be continued.)

REPORT OF CASE OF PLEURITIS CURED BY THREE DAYS' TREATMENT BY HYDRIATIC MEASURES.

BY DUDLEY FULTON, M. D.

Mr. A. J. C., aged 48, applied for treatment for morphinism, August 7. Condition of patient: typical morphine cachexia, emaciated. He complained of sharp pains in the left side, following chilliness and fever, increased by deep breathing.

Examination.— Second day of illness, patient lies on his right side. Facies, painful; breathing, 24 per minute, shallow, dry, painful. Dry cough, lessened expansion of right chest; fremitus normal, and resonance not impaired. Auscultation: loud, well-defined friction rubs in right chest in region of nipple, which smother the breath sounds. Fever, 102.4° F.

Diagnosis.— Incipient pleurisy of middle lobe of right lung.

Treatment. — Fomentations to left chest for 10 minutes every three hours to relieve pain and fill the peripheral blood vessels, and to relieve the congestion of pleura. To "fix" and maintain active peripheral movements of blood, heating compresses were applied to right chest, and changed every three hours; and for derivative effects, hot leg packs were given three times a day. The fever was controlled by these measures, and a cold mitten friction was given every two hours when fever registered above 101.5° F. A coloclyster was given daily, and free diuresis encouraged by abundant water drinking.

Results. — Pain reduced markedly at once, with consequent improvement in respiration; fever controlled, and sleep produced. The third day, the friction sounds had disappeared completely, as well as the fever and all symptoms. Auscultation revealed fine crepitant râles, which disappeared on fifth day. The latter signified a mild pneumonitis, probably secondary to the pleuritis.

TRANSLATIONS AND ABSTRACTS

[THE articles in this department are prepared expressly for this journal.]

Massage in Sciatica. — R. Judica (*Gazz. degli Osped.*, July 23, 1901) discusses the treatment of sciatica fully, and concludes that ointments and embrocations, pills, and empirical remedies, opiates, and palliatives of all sorts should be abandoned, and the treatment greatly restricted. Massage must take the first place, and he names three systems: (1) Schreiber's, aiming at a bloodless nerve stretching, by means of passive and active movements, which Judica does not recommend. (2) Ordinary massage, by passive movements slowly done, and increased in amplitude as the pain will allow, a period of several minutes' rest intervening between each movement; to this should be added small active movements in the recumbent position. (3) The method of Dr. Negro, which Judica strongly recommends. The patient should lie face downward, with the gluteal muscles entirely relaxed. The thumb is then placed over the point of exit of the nerve from the pelvis, and the strongest possible pressure applied with the aid of the other thumb superposed; this is maintained for fifteen to twenty seconds, the thumb being slightly moved in all directions laterally, but not raised; after an interval of a few minutes this is repeated. By half a dozen sittings on alternate days a cure is effected even in old-standing cases. Massage should be used in all cases where there is no anatomical condition demanding surgical treatment, and should be used with patience and technique. It may be advantageously supplemented by electricity (applied in various ways) or by hydrotherapy. Surgical intervention is the last resort in desperate cases, and the right treatment in all cases due to special anatomical causes. — *British Medical Journal, Sept. 14, 1901.*

The Fruit Cure.— The curative value of fruit is becoming more and more insisted upon by those who make a study of dietetics. Grapes are recommended for the dyspeptic, the consumptive, the anemic, and for those having a tendency to gout and liver troubles. Plums, also, are said to be a cure for gouty and rheumatic tendencies. The acid fruits, especially lemons and oranges, are particularly good for stomach troubles and rheumatism.

It is not sufficient, say the advocates of the fruit cure, to eat a small quantity at breakfast or dinner. One should eat from two to eight pounds of grapes a day, or, if oranges are the curative agency, the number to be eaten in a day may vary from three to six.

A healthy condition of the body depends upon a perfect balance of foods taken. There are many other factors entering into the question, but this feature must not be forgotten. Few people there are who can keep healthy without fruit. — *The Syracuse Clinic.*

Faradic Electricity in the Treatment of Acute Gastralgia.—Short (*Birmingham Medical Review*, April, 1901) states that in one of his cases the application of faradic electricity to the pit of the stomach gave prompt relief. He also calls attention to the value of sharp counter-irritation over the stomach by means of blisters.

Increase of Longevity in the United States.— A bulletin has recently been issued by the United States Census Bureau in which a comparison is made between the death rates in that country for 1890 and 1900, which shows that there was a falling off of nearly ten per cent in the proportion of deaths to population during the last decade of the nineteenth century. The average age at which Americans now die is put at 32.5 years, as against 31.1 in 1890, indicating a gain in longevity of 13 per cent. These figures hold good, however, only for cities of eight thousand inhabitants or more, and it is doubtful if the improvement has been as rapid in the rural regions. The bulletin shows, moreover, that the "great white plague," which for so many years claimed more victims than any other malady, no longer stands at the head of the list. The death rate from consumption was 245.4 in every 10,000 persons in 1890, and only 190.5 in 1900. No other disease shows so great a falling off, although diphtheria and bronchitis, cholera infantum, and the diarrheal disorders of adults, general debility and typhoid fever, closely approach

it. The improvement is, of course, partly due to the betterment of sanitary conditions, but some share in it must also be attributed to the more efficient manner in which consumption is dealt with, and to the efficacy of antitoxin in checking the ravages of diphtheria. There are, however, a few diseases which show an increased mortality. From pneumonia there were 191.9 deaths among every 10,000 people in 1900, whereas there were only 186.9 in 1890. The difference, though slight, is sufficient to put pneumonia higher in the list of destroyers of human life than consumption. The increased prevalence of pneumonia is doubtless to be ascribed to influenza, the deaths from which, according to the census bulletin, rose from 6.2 in 1890 to 23 in 1900. The death rates of cancer, apoplexy, and disorders of the heart and kidneys have also markedly increased.— *British Medical Journal, Nov. 16, 1901.*

Lavage of the Stomach in the Treatment of Constipation.—Spivak (*Jour. Am. Med. Assoc.*, April 13, 1901) claims priority for the observation that gastric lavage cures chronic constipation. Lavage is indicated as a therapeutic measure in (1) constipation due to excessive acidity of the stomach; (2) constipation due to gastric atony; (3) diarrhea resulting from the excessive production of mucus in the stomach; (4) obstruction of the intestines from whatever cause; (5) habitual constipation.

By lavage we relieve the upper portion of the bowel from the pressure and weight exerted by the contents of the stomach, relieving the general tension.

His preliminary conclusions are as follows: (1) A certain percentage of individuals suffering from habitual constipation are apt to have a spontaneous movement of the bowels the following day after the stomach has been washed for the first time; (2) the majority of such patients will eventually recover the normal function of their bowels, if lavage is continued daily for two or three weeks, and later at greater intervals; (3) the best results are obtained from using cold water, or hot and cold water alternately; (4) the best time for such lavage is one hour before breakfast. — *International Med. Mag., September, 1901.*

Decrease of Mortality in Switzerland.— The Federal Statistical Office at Berne has just published a report with regard to the ratio of mortality in Switzerland from 1871 to 1890. If one considers the mortality rate in the last decade (1891–1900), the decrease is very striking. Arranged in six groups of five years each, the ratio per 10,000 has decreased as follows, 23.8, 23.1, 21.3, 20.4, 19.6, and 17.8; or a decrease of one fourth in thirty years. This decrease is almost universal, the cantons of Grisons and Valais being the only exceptions, but it is differently distributed over the various parts of the country. The surplus of births over deaths from 1871 to 1890 was 7.3 per cent.— *Lancet, Nov. 2, 1901.*

A Systematic Effort to Exterminate Mosquitoes on Staten Island.— Convinced that malaria is spread by mosquitoes, Dr. Alvah H. Doty, health officer of the port of New York, has begun a war of extermination on the mosquitoes of Staten Island. He has laid out a section of the island about three miles long by a mile and a half wide, in which is a large extent of salt-water marsh and many fresh-water "pockets." Men are making a map of the marshes, pools of stagnant water, cisterns, and cesspools. Dr. Doty is having machines made with perforated pipes by means of which crude petroleum can be released under the water, so as to kill all germs in it. It is his opinion that the use of petroleum has not been entirely successful heretofore, for the reason that it has been simply sprayed on the surface of the pools, and is blown off by the first breeze.— *N. Y. Med. Jour., The Cleveland Med. Gazette, September, 1901.*

A Sanatorium for Lepers.— The Academy of Medicine, in Paris, contemplates the building of a sanatorium for lepers. The cases in France are proportionately few, but there has been no decrease during the last sixty years. There are twenty cases in the Hospital of St. Louis, of Paris, and there are 242 more throughout France.— *American Medicine, Sept. 21, 1901.*

"HEALTH" once meant "holiness;" and that, in the truest sense of the term, means "wholeness."

The Tendo-Achilles Reflex.— Babinski (*Rev. Neurolog.*, May, 1901) again draws attention to the value of the Tendo-Achilles reflex in the early diagnosis of certain nervous diseases. He maintains that its absence will serve to distinguish true sciatica due to affection of the sciatic nerve from hysterical pseudo-sciatica. He holds also that it is of great importance in the early diagnosis of tabes; he states that he has seen only five cases of this disease in which the knee-jerks were absent, but the Achilles reflexes present; while in over forty the latter were alone obtained, or in excess of the former. He showed two cases at the Paris Neurological Society in May in which the diagnosis of tabes could be verified by the absence of the gastrocnemius jerks, although the knee-jerks were present. He believes that the Argyll-Robertson pupil, if present alone, merely indicates that the central nervous system has been attacked by syphilis.— *British Medical Journal, Sept. 7, 1901.*

Vegetable Diet.— Albu (*Berlin klin Woch.*, June 24, 1901) states that a vegetable diet is of value in the following diseases: neurasthenia, neuroses of the stomach, and especially hyperacidity of the stomach, also mucous colitis, chronic constipation, obesity, exophthalmic goiter, renal diseases, and affections of the skin which are associated with disturbance of metabolism; diseases affecting the blood, or diseases of the gastrointestinal tract, such as pruritis, furunculous, urticaria, erythema, exudativum multiforme, and nodosum, as well as various forms of eczema.

Trichinosis in the United States.— H. V. Williams (*Journal of Medical Research*, July, 1901) gives the results obtained by observation on 505 cadavers examined for the purpose of ascertaining the accuracy of the prevalent opinion that the disease is not often met unassociated with epidemics, and to remedy the apparent lack of any such systematic research, previous statistics varying between 0.1 and 3 per cent. In all, 505 cases were examined without any selection as to their likelihood of infection. Trichinæ were found in 27 cases, or 5.34 per cent.

The Hygiene and Mechanical Treatment of Heart Disease.— In two ways the heart, says Boardman Reed, in *American Medicine*, may be injured by the toxic products of improper digestion as well as by suboxidation and other faults of metabolism:—

(1) Its muscles may be directly impaired by the circulating poisons, and at the same time be poorly nourished, in common with all the other muscles, by the blood previously impoverished from the same cause; and (2) its work may be much increased by the contradiction of the arterioles resulting from the reaction of the alloxuric bodies and other products of imperfect metabolism.

He further states that for the prevention of threatened cardiac hypertrophy and the renal changes that so often accompany it, a suitable diet, not too nitrogenous, and an amount of careful, moderate exercise in the open air, sufficient to oxidize fully the food taken, are indispensable. It should be still more important to regulate most carefully the diet and exercise where the heart and kidneys have already undergone pathological changes from the irritation produced of an incomplete proteid catabolism. The uratic group of products of tissue metabolism has now been studied much more fully than the other leucomains. Some of these catabolic products, while no less toxic than the xanthins, apparently act, to judge from clinical experience, in a different way, weakening the cardiac muscle and producing a rapid, irregular pulse with a tendency to degeneration or dilatation, rather than hypertrophy of the heart.

Summing up his interesting article, he says:—

Cardiac disease is often due to autointoxication, especially to poisoning by the alloxuric bases; cure or amelioration in such cases requires at first, in addition to an appropriate diet, not too nitrogenous, the utmost practicable rest of the crippled organ. The cardiac rest may be further promoted by very gentle exercises which dilate the capillaries without taxing the heart; the Nauheim method of treatment spares the heart by dilating the too contracted arterioles in two ways: (*a*) by stimulating the peripheral circulation through carbonated saline baths; and (*b*) by massage and forms of exercise so mild as not to quicken the pulse.— *Charlotte Medical Journal, October, 1901.*

Prevention of Surgical Peritonitis. — J. G. Clark (*Jour. Am. Med. Assoc.*, Aug. 10, 1901) believes drainage as ordinarily employed is superfluous, or even dangerous, and the rational method is to remove all possible débris and infectious matter by thorough irrigation, and then leave one liter of salt solution in the abdominal cavity, and in order to promote and hasten natural drainage, supplement this by an enema of a liter of salt solution, given while the patient is in the Trendelenburg posture. Under this plan the patient is greatly stimulated, shock is minimized or averted, the urinary excretion is greatly increased, and thus toxic matters are more easily eliminated without irritation to the kidneys or bladder, peritoneal infection is quickly eliminated while yet minimum in amount, thirst is alleviated or prevented, intestinal peristalsis is promoted, and consequent tympanites is of less frequent occurrence. — *Am. Jour. of Obstetrics and Diseases of Women and Children, September, 1901.*

Inheritance of a Gouty or Uric-Acid Toxemia in Children. — Carl N. Brandt (*Pediatrics*, April 15, 1901) has observed fifty-seven cases of children between the ages of one and thirteen years, who gave diverse manifestations of the retention of uric acid, such as eczema, indigestion, urticaria, pharyngitis, tonsillitis, joint inflammation, nasal catarrh, asthma, conjunctivitis, and dental caries. The noticeable points were, first, that in all the cases an age had not yet been reached when it is probable the case could have acquired gout or uric-acid toxemia; secondly, that in each case either one or both parents gave histories of uric acid poisoning; thirdly, that the cases in which there was a paternal history were just one hundred per cent greater than those with a maternal history. The individual histories of the children showed that as long as they were properly fed and given plenty of exercise, so long they remained well; but the moment any indiscretion in diet, etc., was allowed, they developed a condition in which acid retention could be demonstrated, and which yielded promptly when the normal uric-acid excretion was again established. — *The Am. Jour. of Obst. and Dis. of Women and Children, June, 1901.*

Danger from the Use of Calomel. — The *Prac. del Med.*, of September, 1900, calls attention to the fact that it is dangerous to administer calomel in small and repeated doses, for the reason that the considerable length of time which the drug remains in the intestine affords opportunity for the insoluble salt to be changed into soluble mercurial salts, as corrosive sublimate, for example, which may give rise to toxic effects. Attention is also called to the fact that calomel which has for a long time been mixed with powdered sugar cannot be administered without danger of the immediate development of toxic effects.

The Toxemia of Pregnancy. — S. Marx (*Medical Record*) concludes a very interesting article as follows:—

1. Toxemia of pregnancy is a complex condition depending on more than one factor.

2. Many women go to term with albuminuria, without symptoms referable to a toxemia. When such symptoms arise, they are not caused by the albumin present, but by faulty urea secretion.

3. In the most desperate and malignant cases there is found neither albumin nor casts.

4. Urea is always found markedly diminished in the so-called true toxemias of pregnancy, or uremias.

5. Finally, I make a strong plea for a regular and methodical course of urea estimation in all cases of toxemia, or for the relegation to secondary importance of the time-honored examination for albumin.

6. Progressive diminution of urea excretion, with or without albuminuria, is the sole indication for the induction of premature labor, which is especially indicated when conscientious medical treatment fails.

A Sanatorium for Tuberculous Children in Rome. — On the occasion of the birth of the daughter of the king of Italy, he donated 200,000 lire ($40,000) toward a fund for the erection of a sanatorium for tuberculous children. — *Albany Medical Annals, September, 1901.*

The Teaching of Physical Therapeutics. — The time is past when the treatment of disease is comprised in the administration of drugs, and to-day more than ever is it recognized that other forces of nature may be so employed as to render therapeutic aid. If evidence of this fact were wanting, it could be found in the circumstances that there are at present being published in English and in German, systems of therapeutics in which physical agents especially are discussed, such as heat, light, water, air, electricity, massage, rest, diet, etc. These are subjects, however, to which scant attention has been given in the past in the medical schools, and by reason of their great importance it would seem that the time is now ripe for their inclusion in the medical curriculum. — *Jour. Am. Med. Assoc.*, Oct. 5, 1901.

Prophylaxis of Tuberculosis. — Lancereaux (*Gaz. des Hopitaux*, April 4, 1901) states that the discovery of the bacillus of tuberculosis has caused the neglect of a study of the soil. He therefore lays before the Academy of Medicine in Paris the results of his investigation of 2,192 individuals from the standpoint of predisposition, including under this head all factors.

In this material he found 1,229 alcoholics, 651 examples of defective aëration with sedentary existence, 82 cases of destitution, and 91 examples of destitution plus pregnancy. In 93 cases heredity appeared to be the essential factor, and in 46 contagion.

It is apparent, then, from these statistics, that over one half of all consumptives studied by Lancereaux were confirmed drinkers. Poverty, defective oxygenation, and in general bad hygiene are seen to have been responsible for 824 cases (a number much smaller than that of the alcoholics).

Analysis of the 1,229 alcoholics showed that no less than 330 of them were women. No one occupation predominated over all others, but many trades were represented. There were only 80 barkeepers, waiters, etc. — *Journal of Tuberculosis, July, 1901.*

Antiseptic Treatment of Smallpox. — Bryan (*Hot Springs Med. Jour.*, January, 1901) suggests the following in the treatment of smallpox: Scrub the skin with strong alkaline soap and water in order to remove the oil naturally existing, and then wash with alcohol, and then again with 1 to 500 solution of bichloride of mercury, following with a solution of peroxide of hydrogen, each of these washings being ten to fifteen minutes in duration. Finally, the parts are well wrapped in an envelope of borated cotton. In the case thus experimented on, this treatment was applied to the forearms and hands, where there was a distinct papillomatous eruption, with the result that the papules in this region failed to become purulent, while in other parts of the body they followed their regular course, with the usual results.

The Influence of Maternal Inebriety on the Offspring. — Sullivan, in Launder's Yearbook on Medicine and Surgery, says: "The death rate among the infants of inebriate mothers was nearly two and a half times that among the infants of sober women of the same stock. In the alcoholic family there is a decrease of vitality in the successive children; for instance, in one family the first three children born were healthy, the fourth was of defective intelligence, the fifth was an epileptic idiot, the sixth was dead-born, and the seventh pregnancy ended in an abortion. There was a sensibly higher death rate in cases in which the maternal inebriety was developed at an early period. Sober paternity had little influence, and in face of maternal drunkenness, might be almost neglected as far as the vitality of the offspring is concerned. Conception in drunkenness has a distinct influence, as was shown by the fact that of the seven cases in which the condition was noted, in six the children died in convulsions in the first months of life, and in the seventh case the infant was still-born. On the other hand, imprisonment during pregnancy, if the imprisonment began early in the pregnancy and lasted nearly all the time, seemed to diminish the evil effects; but the difficulties in drawing conclusions regarding this point was great. Of the children of drunken mothers that survived beyond their infancy, 4.1 per cent (a very high percentage) became epileptic (9 out of 219). These results show the danger to the community of the female drunkard. — *Charlotte Medical Journal, October, 1901.*

The Etiology of Melancholia.— H. H. Stoner (*Medical News*, Aug. 17, 1901) believes that melancholia is due to a disturbed balance between anabolic and catabolic tissue metabolism. It is an emotional disease, wherein the emotions are of a painful character, and the emotions he regards as wholly dependent upon vegetative functions. According to this observer, the cortical cells, or psychical neurons, functionate normally in melancholia; the quality of the sensation depends on the kind of stimulus inducing it; the quality of the sensation in melancholia is invariably painful, consequently it is due to the normal interpretation by a healthy cell of an abnormal stimulus. Assuming that a stimulus which enhances the metabolic process produces pleasurable emotions, and one which inhibits the process calls forth painful emotions, it is inferred that undue destructive metabolism is the abnormal stimulus referred to. The mental depression is explained by the patient's being absorbed by the painful emotions; that the psychical cells are not at fault is shown by the fact that the patient can be roused to the appreciation of other stimuli. The author considers that the successful treatment of melancholia goes to prove the validity of his theory, as the only successful treatment tends to the re-establishment of the normal balance between constructive and destructive metamorphosis.— *Medical Record, Aug. 24, 1901.*

A New Method of Testing for Lactic Acid.— Knapp (*New York Medical Journal*, Aug. 10, 1901). A very weak solution of ferric chloride of the strength of 1 to 2000, freshly prepared, is needed. The test is performed as follows: One cubic centimeter of the filtered gastric juice is put into a cylindrical separatory funnel, and to it is added ether up to five centimeters. The gastric juice with the ether is then well shaken, by which procedure the lactic acid, if present, is extracted by the ether. This is allowed to remain quiet for a little while, to permit of the separation of the two liquids. About two centimeters of the iron solution is put into a test tube of about half an inch in diameter, the iron solution appearing then pratically colorless. The test tube is now held inclined, and the ether extract is allowed to run slowly from the separatory funnel on the wall of the test tube, which is now turned to a vertical position. At the line of contact of the two liquids appears the canary-yellow ring, which is in very marked contrast with both the subnatant and the supernatant fluids. If this canary-yellow ring is not so well distinguished immediately, then the test tube may be looked at again after a few minutes. To see this yellow ring better, a white paper is held behind the test tube, the tester's back being turned toward the source of light.— *Monthly Cyclopedia of Practical Medicine, October, 1901.*

The Prevalence of Cancer in Ireland.— The thirty-seventh annual report of the Registrar-General for Ireland, recently issued, contains some very interesting statistics as to the increased prevalence of cancer as shown by the death-rate tables for Ireland, England, and Scotland. Referring to Ireland, the report contains a most valuable colored map showing the distribution of the disease in that country between the years 1896 and 1900. From this it appears that the mortality varies widely in the different counties, being lowest in Kerry, where the rate is 2.76 per 10,000, and highest in Armagh, where the number is 10.9 per 10,000. During the year 1900 no less than 2,717 deaths were attributed to cancer, being an increase of more tr an sixty over the number quoted for the preceding twelve months. During the last thirty-six years the cancer death rate has steadily grown from 2.6 to 6.2 per 10,000. It is no consolation to know that the state of things in England and Scotland seems to be even worse, the mortality line in Great Britain having also risen greatly during the same period. In England the rate per 10,000 has advanced since 1864 from 3.8 to 8.4; in Scotland, from 4.2 to 8.2. It is difficult to see where any statistical fallacy can come in to explain away or to modify the unsatisfactory import of these figures.—*Lancet Nov. 2, 1901.*

Prophylactic against Mosquito Bites.—

℞ Olei picis leq.,
Olei olivae, of each, 6 drachms,
Olei hedeomae (pennyroyal), ½ ounce,
Spts. camphorae, 3 drachms,
Glycerini, 2½ drachms,
Acidi carbolici, 1 drachm.

M. Sig. : Apply to surface on retiring.

—*Jour. Am. Med. Assoc.*

Extinction of Leprosy in the Hawaiian Islands.— Superintendent Reynolds, of the colony of lepers, states that leprosy is being slowly, but none the less surely, eradicated in the Hawaiian Islands. Five years ago there were over thirteen hundred inmates in the leper settlement on the island of Molokai; when the annual visit was made a few days ago, there were only nine hundred. This is due, not so much to the scientific treatment of the disease, as to the fact that the native race is gradually dying out. Of those who are now inmates of the colony, all but fifty are native Hawaiians, fifteen are whites, and thirty, Chinese. Last year just one hundred lepers were sent to the island, but only fifty have been sent in the last nine months. In the biennial period ending December, 1900, directly after the islands had been annexed, over five hundred were transferred to the settlement. This was due to the fact that the matter was taken from the hands of the party formerly in charge of such cases, and those afflicted with this disease were hurriedly sent to the place of segregation. Heretofore, many such persons have remained in Honolulu through political influence.—*Lancet, Nov. 2, 1901.*

Water Purification with Ozone.— The New York *Sun* reports that a new method of sterilizing a city's water supply is being successfully operated in Russia. Nicholas Simin, chief engineer of the city of Moscow, where the system has been adopted, described the method in a paper forwarded to the annual meeting of the American Association of Water Works Engineers.

The introduction of ozonized air into the water destroys all the bacteria, and makes it at comparatively small cost absolutely safe for drinking purposes. The ozone burns all organic matter with which it comes in contact in water, including bacteria and their vital products. The pathogenic bacteria are among the first to be destroyed. The air, before coming in contact with the water, is subjected to a series of electrical discharges, changing the diatomic oxygen to triatomic oxygen, which is ozone. The cost is put at $6.25 for each million gallons of water purified. The water is rendered colorless, sparkling, and odorless, and no foreign matter is introduced except oxygen, which, of course, is beneficial.— *The Sanitarian, October, 1901.*

A ROYAL Commission on Tuberculosis (*The Lancet*, Sept. 14, 1901) has been appointed by the British government in response to the unanimous desire of the British Congress on Tuberculosis. The Commission has full powers to investigate the comparative phenomena of tuberculosis in man and animals, and is expected to prove or disprove the truth of Professor Koch's independent assertion. It is to decide: (1) Is the disease in animals and in man one and the same? (2) Can man and animals be reciprocally infected with it? (3) Under what conditions, if at all, does the transmission of the disease from animals to man take place, and what are the circumstances favorable to such transmission? The commissioners are Sir Michael Foster, Dr. Sidney Martin, Prof. Sims Woodhead, Prof. J. McFadyean, and Prof. Robert Boyce.

Tobacco as a Cause of Glycosuria.—Heinrich Stern (*Med. Record*, April 27, 1901) says: "The habitual or excessive use of tobacco will not only aggravate an existing glycosuria, but it will, though less frequently, set up this condition. Tobacco influences the output of glucose in cases of glycosuria in three ways: First, by protracting the duration of transitory glycosuria and by imparting to alimentary melituria a certain degree of chronicity; secondly, by increasing the quantity of dextrose in the twenty-four hours' urine, in the transitory as well as the chronic forms of glycosuria; thirdly, by transforming the moderate degrees of chronic glycosuria into the graver forms. Nicotine is not the causative factor in tobacco glycosuria. The substance in tobacco smoke, regarded as of greatest importance, is the carbon monoxide due to the imperfect combustion. This view seems to find credence in the fact that glycosuria is found only in smokers of cigars, and not in those who use pipes."— *Monthly Cyclopedia of Prac. Med., August, 1901.*

UPON the occurrence of pericarditis or endocarditis in the course of rheumatic fever in children, E. U. Mitchell, of Cincinnati, says an ice-bag may be applied to the heart; but it must be remembered that young children sometimes bear cold applications badly.— *Cin. Lan. Clinic, Sept. 14, 1901.*

BACTERIOLOGICAL NOTES.

[THE notes appearing in this department are abstracts or translations prepared expressly for MODERN MEDICINE from original sources.]

The Diagnosis of the Presence of Bacillus Coli Communis by Means of Neutral Red.— William Hunter (*British Medical Journal*, Sept. 21, 1901) states that within the past few years a considerable amount of attention has been paid to the methods of distinguishing the bacillus coli communis from the bacillus typhosus. Of the many tests which have been proposed — as milk test, the indol reaction, etc. — there is scarcely one which may not fail. Even the agglutination test is not always reliable.

Quite recently a good deal of attention has been directed to the use of colored media as a means of diagnosing between the bacillus coli communis and the bacillus typhosus. Many of the methods proposed have proved to be highly satisfactory. This is mainly due to the fact that the slightest change in the color of the tinted medium is easily recognizable. The majority of the earlier methods have all one great drawback; that is, they do not afford an opportunity of rapid diagnosis. Now in the case of the bacillus typhosus and the bacillus coli communis, it is usually important to give an early diagnosis; therefore colored media upon which these micro-organisms grow rapidly must be employed. Of these, the most valuable is that proposed by Rothberger in 1898. This investigator found that if small quantities of neutral red (in saturated watery solution) are added to the tube containing agar-agar, and these inoculated with the bacillus typhosus and the bacillus coli communis, a striking result is obtained. In the case of the tubes which have been inoculated with the bacillus coli communis, the neutral red agar becomes greenish yellow and fluorescent within twenty-four to thirty-six hours. In those which have been inoculated with the bacillus typhosus no change is produced in the medium.

During the past two years I have had frequent opportunity of studying the morphological and biological characteristics of the bacillus typhosus and the bacillus coli communis, and ultimately came to the conclusion that with the present methods it was scarcely possible to determine with certainty the presence of bacillus typhosus or bacillus coli communis in pure culture. The method proposed by Rothberger, however, appeared to me to be worthy of further study, and the results which I obtained I published in the *Lancet* of March 2, 1901. Since I commenced my experiments I have tested a large number of stains of bacillus typhosus and bacillus coli communis, and have always obtained absolutely constant results. Bacillus coli communis always produces a fluorescence and change of color of the neutral media in twenty-four hours; the bacillus typhosus, never.

At the same time the reaction cannot be regarded as specific. Other micro-organisms, as bacillus tetani, B. edematis maligni, bacillus proteus vulgaris, B. prodigiousus, etc., also give the reaction. This, however, does not affect the value of the reaction in regard to the diagnosis between bacillus typhosus and bacillus coli communis. So far all investigators are agreed, that no stain of bacillus typhosus is able to affect the slightest change in color of the neutral red agar.

The conclusions which I feel justified in drawing are the following:—

1. That the B. coli communis and a few other micro-organisms possess the power of reducing neutral red to a canary-yellow fluorescent color.

2. That the B. typhosus never possesses this power of reduction.

3. That it is possible within from twelve to twenty-four hours to diagnose with accuracy by means of neutral red, the typhoid group of micro-organisms from the true coli group.

The Active Principles in Typhoid Cultures. — Paladino-Blandini (*Rif. Med.*, April 17, 1901) has isolated two substances from typhoid cultures, one a grayish-white substance having the chemical character of a nuclein, the other yellowish-brown, in shining, very fragile scales, and having the properties of a nucleo-albumin. The agglutinating power was found to depend on the presence of a special nucleo-albumin, which by itself is capable of endowing the blood of animals treated with it with the power of agglutination. This nucleo-albumin is unable to act as an agglutinating agent without the presence and assistance of leucocytes. — *British Med. Jour., June 29, 1901.*

Frequency of Typhoid Bacilli in the Blood.— R. I. Cole (*Johns Hop. Hosp. Bull.*) has shown by a series of cases that typhoid may be found very frequently in the blood. Kühnau, in 1897, was able to find the bacilli in the blood in only eleven out of forty-one cases, and other observers have been much less successful than this. Scholz and Krause state that cultures from the blood of typhoid patients are of little value since the bacilli are rarely to be found. The writer has had better success. The typhoid bacillus was cultivated in eleven out of a total of fifteen cases in which cultures were made. The greatest care was used in securing asepsis, and the diagnosis of bacillus typhosus in each case was decided by motility, staining properties, typical growth on agar, glucose agar, gelatin, litmus milk, bouillon, Dunham's peptone solution (which after one week's growth was used for indol test), and, finally agglutination by known typhoid human serum, dilution 1 to 50, in one hour. Frequently a fairly definite conclusion can be reached in thirty-six hours after obtaining the culture. If the bacilli grow out in the bouillon in twenty-four hours, they can be transferred at once to the various media, and from the slant agar after six to eight hours, a suspension in bouillon can be made in which the serum reaction can be tried. — *Med. Standard, September, 1901.*

Concerning the Clinical Significance of the Klebs-Loeffler Bacillus.— A. Rupp (*New York Med. Rec.*, 1901) offers the following summary and conclusions on this question: 1. Clinically there are two kinds of diphtherias when Klebs-Loeffler bacilli are taken into account: (a) Those having the Klebs-Loeffler bacilli present; (b) Those having none. Both forms, however, develop the same clinical signs and symptoms, the same complications and sequelæ — von Behring to the contrary. 2. The character or quality of the Klebs-Loeffler bacilli that may be present in any case of diphtheria does not prognosticate its course or termination. 3. Klebs-Loeffler bacillary diphtheria may be so mild as to stimulate a simple tonsillitis, and yet the most virulent Klebs-Loeffler bacilli be present. 4. Virulent Klebs-Loeffler bacilli may be present in the throats of healthy people, never doing any harm to the persons harboring them, nor harming in any noticeable way or manner those who have come into close and intimate contact with the bacilli — infected people. 5. Klebs-Loeffler bacilli are found associated with other bacteria in other diseases than diphtheria, but they fail to exert any appreciable influence on the progress and decline of those diseases. 6. Klebs-Loeffler bacilli vary much in size and shape, from a regular and artificiallly determined type, and the quantity and quality of their toxicity is not bound in any special or definite to fit any particular typical or atypical form, if the most recent bacteriologic utterances on the subject be true. 7. The virulence or disease-producing qualities of Klebs-Loeffler bacilli can be determined only by experimental inoculation tests. All that the microscope can do in this matter is to differentiate their forms; every other delivery based on microscopic investigation alone is largely guesswork or hypothetic speculation. 8. The ubiquity of the Klebs-Loeffler, and their irregular and varying forms, besides the inconstancy of their qualities, occurring as they do with clinical phenomena that are in no determinable way to be correlated with these physical irregularities of Klebs-Loeffler bacilli, make it impossible to grant them any primary specific etiologic importance in the pathogenesis of clinical diphtherias. 9. The "necessary influences," and the "favoring conditions," besides other factors of which we are still ignorant enfold within themselves the secret of the real causes of clinical diphtherias. 10. The assumed etiologic and pathogenetic supremacy of the Klebs-Loeffler bacilli is largely, if not altogether, a synthetic demonstration. And, although this synthesis is not altogether a bridge of fancies, enthusiastic laboratory workers and their unquestioning followers, both lay and professional, are traveling to and fro over it, unhampered by any of the odious uncertainties and difficulties that have been presented. Of course a bridge that will not load itself with what it cannot bear will give support to any amount of "will to believe," but breaks under the weight of facts that it denies passage to. — *St. Louis Medical Review.*

The Toxin of the Colon Bacillus. — Since the discovery by Prof. V. C. Vaughan and McClymonds, that practically all samples of American cheese contain the colon bacillus, and that cultures of this organism may be boiled without destroying its toxicity, work on its toxin has been carried farther by the former (*American Medicine*, May 18, 1901, p. 302), assisted by Cooley and Gelston. The bacilli with which they worked were obtained from cheese, water, and normal feces, and their virulence was intensified by passage through a number of animals. After inoculation of Roux flasks of two-per-cent agar with a beef-tea culture of the bacillus and subsequent incubation, the growths were scraped from the surface of the agar, and used in the preparation of the toxin. The facts learned from numerous experiments with the germ substance thus obtained are summed up as follows: —

The toxin is contained within the germ cell, from which it does not, at least under ordinary conditions, diffuse into the culture medium. It is not extracted from the cell by alcohol, ether, or very dilute alkalies, nor is it destroyed when the germ substance is heated to a high temperature with water. Neither the germ cell nor its toxin is much, if at all, affected by boiling with a two-per-cent solution of hydrochloric acid, but the former is broken up and the latter affected, but not destroyed, by being heated for an hour on the water-bath with water containing from one to five per cent of the acid, and the toxin is made inert by prolonged heating. The toxin, separated from the cell wall by digestion of the latter with two-per-cent hydrochloric acid and 0.5-per-cent pepsin, is markedly active and stable, and can be permanently preserved in the dry state.

How the toxin, if confined in the cell wall, is set free when the living or dead germ is introduced into an animal; whether, if this is accomplished by phagocytic action, the phagocytes destroy the toxin when they kill the germ; whether the cell contained both a toxin and an immunizing body, or the toxin can be converted by artificial means or within the system into an immunizing body, are questions under investigation. — *Am. Jour. of the Medical Sciences, October, 1901.*

A Bacillus Isolated from the Blood of Syphilitics. — De Lille and Jullien (*Academie de Med.*, Paris, July 2, 1901) report the successful isolation of a characteristic bacillus from the blood of syphilitics. The blood in each case was taken from a vein of the arm; in this blood are to be seen the spherical refractile bodies which have been described by other writers, but the nature of which has not been elucidated. The authors believe that the negative results of culture experiments hitherto have been due to the presence in the coagulated blood of a bactericidal alexin. They have used for culture, blood plasma separated from the serum, and also fluid from blisters which they state is alexine-free. From these on the ordinary media they almost always obtain a culture; in cases primarily negative they were successful by using the method of culture in a collodion sac.

The bacillus is polymorphic, either short or thread-like. The appearances on culture media are described. The bacillus is pathogenic to guinea pigs, and produces locally an indurated ulcer with swelling of the nearest lymph glands; the organism was in no case found in the cadaver. The blood of syphilitic patients added to a three-days'-old culture of the bacillus, causes agglutination of the latter; normal serum produces no such effect. From a rabbit inoculated from a culture, a large quantity of blood was obtained on the third day; on separating this into plasma and serum, cultures were obtained from the plasma, not from the serum, an observation which supports the theory of an alexin in the serum. This alexin, the authors state, is "fixed" by the isolated bacillus when the latter is injected into animals already infected with syphilitic products. — *British Medical Journal, Aug. 30, 1901.*

Gastro-Intestinal Disinfection. — Schutz (*Berlin, Klin. Woch.*) has confirmed the results obtained by Nicati and others with reference to the disinfectant action of the intestine upon cholera bacilli. Dogs were fed upon cultures of cholera vibrio, but the stools contained none of the germs. The gastric juice was then excluded from the duodenum, and the culture introduced. In this case the stools were also free, the colon gave

one colony, and in the small intestine cultures were obtained only with difficulty. The same results were obtained when animals were fed upon food containing cultures of cholera vibrio.

After the administration of calomel and castor oil, the bacilli were found in the stools, and the ordinary bacilli were also more numerous.

From these investigations it will be seen that the disinfectant action of the gastric juice and bile is transient, and that there must be some natural disinfectant secreted by the intestine, which, as suggested by Buchner, is probably of the nature of a ferment. The author calls attention to the uncertainty of artificial disinfectants.

Bacterial Flora in Mouth of the Newborn.—O. Kneise (*Beitraege Z. Geburt U. Gynaek*, IV, 1, Leipsic).

In 97.5 per cent of a large number of infants examined, abundant bacterial flora was discovered in the mouth at the moment of birth. Staphylococci and streptococci were particularly numerous and virulent in many cases. The bacteria found were always identical with those discovered in the vaginal secretions at the same time, and are evidently due to the aspiration of these secretions in the infant's attempts to swallow, or they are forced into its mouth by pressure of the vaginal muscles. These germs in the infant's mouth are probably the source of mastitis in many cases, and if necessary in its treatment, the child must be kept from the affected breast. They also prove the fallacy of the assumption of the autosterilization of the vagina. —*Jour. Am. Med. Assoc., August 17, 1901.*

The Bacteriology of Acute Articular Rheumatism.— Meyer (*Deut. Med. Woch.*, No. 6, 1901), after a series of fruitless attempts to isolate an organism from the blood and articular effusion in five typical cases of acute rheumatism, found a small diplostreptococcus in the mucous secretion covering the tonsils. It stained feebly by Gram's method, required a high degree of alkalescence, a large proportion of peptone in media, grew on blood agar as small, clear droplets, made broth uniformly turbid, coagulated milk, and on injection caused a local nonsuppurative necrosis, followed in six to ten days by serous or seropurulent joint effusions which were for the most part sterile, and in most cases disappeared without leaving any permanent lesion. In some of the animals inflammation of the valves of the heart was also found. The blood was always sterile. In five cases bacteriological examination of the heart lesion was negative; in two, a pure culture of the organism was obtained. The author believes the organism is identical with that found by Von Leyden and Wassermann, and that it is in all probability the cause of acute articular rheumatism. —*British Medical Journal, Oct. 5, 1901.*

The Comparative Virulence of the Tubercle Bacillus from Human and Bovine Sources.— Dr. M. P. Ravenel (*Lancet*, Aug. 17, 1901, p. 443) makes the following statements:—

The tubercle bacillus from bovine sources has in culture fairly constant and persistent peculiarities of growth and morphology by which it may tentatively be differentiated from that ordinarily found in man.

Cultures from two sources differ markedly in pathogenic power, affording further means of differentiation, the bovine bacillus being very much more active than the human for all species of experimental animals tested, with the possible exception of swine, which are highly susceptible to both.

Tuberculous material from cattle and from man corresponds closely in comparative pathogenic power to pure cultures of the tubercle bacillus from the two sources, from all animals tested.

It is a fair assumption, from the evidence at hand, and in the absence of evidence to the contrary, that the bovine tubercle bacillus has a high degree of pathogenic power for man also, which is especially manifest in the early years of life.— *Charlotte Medical Journal, October, 1901.*

Dusty Roads.—"Sometimes I get tired of this out-of-door life. Do you think it's healthful to sleep on the ground every night?" *Weary Waggles.* — "H'm. What a question that is! Don't you know that there are more people every year who die in their beds than anywhere else?"— *Boston Transcript.*

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A LAST WORD ABOUT DIGESTION.

PAWLOW'S discovery of a method by which the phenomena of gastric digestion, particularly the functions of acid and pepsin formation, could be more accurately studied, has led to practical results of the highest value. In all previous experiments, the results have been seriously complicated by the admixture of the food stuffs with the gastric secretions, so that the conclusions drawn were necessarily more or less inaccurate, and, in many cases, it was impossible to derive from the data thus obtained any accurate or trustworthy conclusions whatever. Pawlow, however, discovered a means by which this difficulty could be overcome. He devised an operation whereby a portion of the stomach could be separated from the rest without disturbing its nerve or blood supply, so that when food was administered to an animal the substances introduced into the stomach entered only a portion of it, leaving a *cul de sac* open to observation, and wholly free from foreign materials or other disturbing elements. It was thus found possible, by feeding the animal different substances, to ascertain the exact influence of these substances upon pepsin secretion and acid formation.

In the preparation of an animal for experiment, it is first given a large meal, by which means it is found that all the pepsin formed was forced out of the mucous membrane and consumed in the digestion of the blood, so that the stomach was completely aseptic at the beginning of the experiment some hours later. We have not space to recount the details of the experiments made by Pawlow, Herzen, Radzikowsky, and others; it is sufficient to give the results. It was found that there are three classes into which food substances or elements may be divided: —

1. Those which promote pepsin formation. The common or yellow dextrin of commerce — not the white variety, which is practically inert — possesses the power of stimulating the stomach to secrete pepsin to a most remarkable degree, increasing the quantity of pepsin from five hundred to six hundred per cent.

2. Substances which promote the secretion of acids. Liebig's extract of beef was found to possess this property in a very high degree.

3. Substances which promote both the secretion of pepsin and the production of acid. The chief of these were raw meat, meat juice, meat broth, and pease broth.

The practical deductions from these experiments are of the highest importance, and have been proved, by actual experiment, to be reliable. Let us notice some of these: First, in relation to hyperpepsia or hyperchlorhydria: This condition is one which has been the occasion of no small amount of inconvenience to physicians as well as to patients. The custom of confining these patients to an almost exclusive meat diet has long prevailed, but without satisfactory results; the patient is temporarily relieved, but not permanently cured. The writer has had under observation scores of cases of this sort, in whom the exclusive meat diet had been faithfully carried out for months without any curative results whatever, the only tangible effect being to render the patient more and more dependent upon the use of soda and magnesia as neutralizing agents, and making him a complete slave to his meat diet through a continued increase of acid formation. What the

hypopeptic patient requires is a dietary which will increase the formation of pepsin. This will render possible the utilizing of the large amount of acid formed, which may then become a means of promoting his welfare instead of being a source of distress and injury. It is impossible to suppose that a person would actually suffer from the secretion of excessive gastric juice in connection with the meal, provided the latter were normal in character. That the gastric juice formed in hyperpepsia or hyperchlorhydria, is not a normal secretion, however, is made very apparent by the facts developed through a careful study of the gastric secretion by the accurate and refined method devised by Hayem and Winter, especially when combined with the method of Toepfer. The combination of these two methods renders possible the exact determination of the amount of free hydrochloric acid, the amount of acid-combined chlorine and the amount of neutral-combined chlorine, in any given special gastric fluid. By comparison of these elements, it is possible to determine the coefficient of digestive work done upon albumin in the stomach.

In the examination of over 17,000 stomach fluids by these methods, which has been carefully done in the Physiological Laboratory connected with the Battle Creek Sanitarium, it has been found, almost without exception, that the coefficient of proteid digestion is low in hyperchlorhydria as compared with normal digestion and with hypopepsia. In hypopepsia and normal digestion, for example, the coefficient generally ranges from .85 to 1.25, and sometimes even higher, while in hyperchlorhydria it is not uncommon to find a coefficient as low as .30, .40, and sometimes even much lower. The fact has been noted by other observers who have made careful determinations of the coefficient of digestive work.

In a recent paper by Bellamy (*Lancet*, Sept. 28, 1901), the position was clearly taken that the objective point of therapeutics in hyperpepsia should be to increase the pepsin formation; and this should be accomplished by a regulation of the dietary rather than by the use of medicaments. Laboratory experiments and actual experience show that this can be accomplished by the administration of dextrin. For scores of years dextrin has been employed with success in the treatment of gastric disorders at Carlsbad, the dextrin being administered in the form of zwieback. For twenty-five years the writer has made use of the same method, in the same way, and for a number of years back he has systematically administered to all his patients suffering from hyperpepsia, at the beginning of each meal, a liberal quantity of dextrin in the form of wheat flakes, thoroughly cooked and roasted until slightly browned. By this mode of preparation the starch of the wheat is converted into achroödextrin. It is possible also that there is some other substance associated with the dextrin, the nature of which has not yet been fully determined, to which the stimulation of pepsin formation is really due. This would seem to be the case, from the fact that the purified dextrin known as white dextrin is absolutely inert. We also find in this fact a valuable hint that ought not to be forgotten, and which suggests that the treatment of food stuffs by chemical processes may so change their properties as to render them of little or no value as food, although their composition may remain unchanged. It is on this ground that the writer has always objected to the substitution of glucose for natural sweet stuff, and this may practically afford the possible explanation for the gastric disturbances set up by cane sugar in such a multitude of cases.

It is not necessary that one should swallow commercial dextrin in order to obtain all the benefits which may be

derived from this powerful peptogen. It is essential only that a considerable part of the meal shall consist of cereal substances which have been properly prepared by thorough cooking, and subsequent subjection to a temperature of 280° to 300° for a sufficient length of time to dextrinize the starch. Browned rice and the toasted wheat flakes, well browned zwieback, and granose flakes or granose biscuit, slightly browned, afford just the elements required by cases of this sort. It is best that these food stuffs should be taken dry, as this secures a liberal admixture of saliva, which, acting upon the starch, may convert a considerable portion of it into peptogenic dextrin.

In the treatment of hypopepsia, in which there is a deficient formation of acid, it is necessary only to take care that the food contains a sufficient amount of substances capable of stimulating acid formation. It is not necessary to suppress the dextrin-containing substances, for these can do no possible harm by aiding the stomach in the formation of its pepsin; but the substances which encourage acid secretion must be added. The most powerful substances of this sort appear to be extractives of meat and leguminous seeds. Research will doubtless develop other sources of "succagogues," as Pawlow terms these acid-promoting substances.

These researches afford a rational basis for the management of gastric disorders by a regulation of the dietary rather than by a system of medication,—as Bellamy well says, "The simple, and even nourishing nature of the substances which may be employed to further the production either of juice or pepsin, is a great consideration in favor of their use. . . . Nature is, so to speak, assisted through the agency of her own materials; food is necessary for the maintenance of life, and it should be the aim of the therapist to remedy the cause of disordered digestion through the natural channel offered by alimentation rather than by the more artificial, but in no more scientific resources, of pharmacodynamics."

A practical point which may be further mentioned, is that the administration of dextrin by the rectum stimulates the formation of pepsin as well as when the dextrin is administered by the stomach. It is hence possible to bring into action this powerful peptogenic substance in cases in which there is deficiency of pepsin without introducing into the stomach fermentable substances, the digestion of which might be interfered with by the gastric juice. By the administration of both dextrin and extractives it is found possible to increase gastric activity twenty-five to thirty times.

RULES recommended by the School Children's Committee of the British Dental Association (*Journal of the British Dental Association*) have been circulated for the information of managers and teachers of the national schools in Ireland. "Without good teeth there cannot be good mastication. Without thorough mastication there cannot be perfect digestion, and poor health results. Clean teeth do not decay. The importance of a sound first set of teeth is as great to the child as a sound second set is to the adult. Children should be taught to use the toothbrush early. Food left on the teeth ferments, and the acid formed produces decay. Decay leads in time to pain and the total destruction of the tooth. The substance of the following rules should therefore be impressed constantly upon all children: —

1. The teeth should be cleaned at least once daily.

2. The best time to clean the teeth is after the last meal.

3. A small toothbrush with stiff bristles should be used, brushing up and down and across, and inside and outside, and in between the teeth.

4. A simple tooth powder or a little soap and some precipitated chalk taken up on the brush may be used if the teeth are dirty or stained.

5. It is a good practice to rinse the mouth after every meal.

6. All rough usage of the teeth, such as cracking nuts, biting thread, etc., should be avoided; but the proper use of the teeth in chewing is good for them. When decay occurs, it should be attended to long before any pain results.— *International Medical Magazine, September, 1901.*

REVIEWS.

A SYSTEM OF PHYSIOLOGIC THERAPEUTICS. A Practical Exposition of the Methods, Other than Drug-Giving, Useful in the Prevention of Disease and in the Treatment of the Sick.— Edited by Solomon Solis Cohen, A. M., M. D., Professor of Medicine and Therapeutics in the Philadelphia Polyclinic; Lecturer on Clinical Medicine at Jefferson Medical College; Physician to the Philadelphia Hospital, etc. VOLUME III — CLIMATOLOGY, Health Resorts, Mineral Springs. By F. Parkes Weber, M. A., M. D., F. R. C. P. (Lond.) Physician to the German Hospital, Dalston; Assistant Physician North London Hospital for Consumption, etc. With the Collaboration for America of Guy Hinsdale, A. M., M. D., Secretary of the American Climatological Association, etc. In Two Books. Book I — Principles of Climatotherapy — Ocean Voyages — Mediterranean, European, and British Health Resorts. Book II — Mineral Springs, Therapeutics, etc. Illustrated with maps. Price for the complete set, $22.00 net.

These are the Third and Fourth Volumes of Cohen's System of Physiologic Therapeutics, whose timeliness has already been commented upon. The first part treats of the factors of climate, with their effect on physiologic functions and pathological conditions, and describes the fundamental principles that underlie the application of climates, health resorts, and mineral springs, in the prevention of disease, and to promote the comfort and recovery of the sick.

The second part describes health resorts; and the third part discusses in detail the special climatic treatment of various diseases and different classes of patients. Book II also describes the health resorts in Africa, Asia, Australasia, and America.

In Book I, ocean voyages are first treated of with considerable detail, and their advantages and disadvantages, indications and counterindications as a therapeutic measure, are pointed out. As very little exact information on this important subject exists in an available form, this chapter should be of great use to physicians. The subject of altitude is treated in a similarly full and definite manner, and not only are we told what classes of patients and disorders are benefited by Alpine and Rocky Mountain climates, but also what classes are unsuitable for such treatment. The difference between summer and winter climates in Switzerland, and the therapeutic indications for the different seasons are discussed at length. In addition, the seacoast and inland health resorts of the Mediterranean countries, those of Continental Europe, and those of the British Islands, including mountain stations of various elevations, plains, and mineral-water spas, are described, with no waste of words, but with a fullness of detail unusual in medical books. Not only geographic and climatic features are pointed out, but also social and other characteristics so important in selecting a resort that shall be suitable to the tastes and means of the individual patient, as well as beneficial in his disease. Throughout this section allusion is made to the special medical uses of the various resorts described, and to the particular form of treatment for which any one is famous.

The existence of sanitariums for special diseases, as those at seaside resorts for scrofulous and weakly children, and in various regions for consumption, nervous affections, diseases of women, and the like, are specified; and the mere lists of such places, as found in the index, are likely to prove invaluable for reference. A mere glance at the closely printed pages of the index will show how unusually full is the treatment of special resorts and their particular qualities. Like the preceding volumes, these are thoroughly scientific and eminently practical, a combination that reflects credit alike on authors and editors.

These volumes are the first in a series which has long been needed. Empiricism and irrational methods are still quite prevalent in the routine practice of the average physician. Nothing could be more helpful to the advancement of scientific medicine than the setting forth of the resources of physiological therapeutics. The editor of the work, Dr. Cohen, brings to his task the results of many years of careful study and wide research, and the result promises to be one of the most important contributions to practical medicine that has been made in many years.